TM 9-1276/TO 39A-5AD-2

This manual supersedes TM 9-1276, 22 January 1947; TB ORD 2, 22 December 1943; TB ORD 365, 22 July 1949; TB ORD 396, 8 November 1950; and those portions of TB ORD 385, 24 May 1950, and TB ORD 415, 17 October 1951, pertaining to the matériel covered herein

CAL. .30 CARBINES M1, M1A1, M2, AND M3

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DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON 25, D. C., *17 February 1953*

TM 9-1276/TO 39A-5AD-2 is published for the information and guidance of all concerned.

[AG 474.5 (18 Nov 52)]

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual is published for the information and guidance of personnel responsible for field and depot maintenance of this matériel. It contains instructions and information concerning maintenance which is beyond the scope of tools, equipment, or supplies normally available to using organizations. This manual does not contain information which is intended primarily for the using organization, since such information is available to ordnance maintenance personnel in the pertinent operator's technical manuals or field manuals.

b. This manual contains a description of and procedures for removal, disassembly, inspection, repair, rebuild, and assembly of the cal. .30 carbines M1, M1A1, M2, and M3. The appendix contains a list of current references, including supply catalogs, technical manuals, and other available publications applicable to the matériel.

c. FM 23–7 contains operating and lubricating instructions for the matériel and contains all maintenance operations allocated to using organizations in performing maintenance work within their scope.

d. This manual differs from TM 9–1276, 22 January 1947, as follows: Adds information on comparator inspection of certain trigger housing group components; technical inspection, repair and rebuild.

2. Field and Depot Maintenance Allocation

The publication of instructions for complete disassembly and rebuild is not to be construed as authority for the performance by field maintenance units of those functions which have been restricted to depot shops and arsenals. In general, the prescribed maintenance responsibilities will apply as reflected in the allocation of maintenance parts listed in the appropriate columns of Department of the Army Supply Catalog Ord 8 SNL B–28. Instructions for depot maintenance are to be used by maintenance companies in the field only when the tactical situation makes the repair functions imperative. Provisions of parts listed in the depot guide column of ORD 8 supply

catalogs will be made to field maintenance only when the emergency nature of the maintenance to be performed has been certified by a responsible officer of the requisitioning organization.

3. Forms, Records, and Reports

a. General. Responsibility for the proper execution of forms, records, and reports rests upon the officers of all units maintaining this equipment. However, the value of accurate records must be fully appreciated by all persons responsible for their compilation, maintenance, and use. Records, reports, and authorized forms are normally utilized to indicate the type, quantity, and condition of matériel to be inspected, to be repaired, or to be used in repair. Properly executed forms convey authorization and serve as records for repair or replacement of matériel in the hands of troops and for delivery of matériel requiring further repair to ordnance shops in arsenals, depots, etc. The forms, records, and reports establish the work required, the progress of the work within the shops, and the status of the matériel upon completion of its repair.

b. Authorized Forms. The forms generally applicable to units maintaining these weapons are listed in the appendix. For a current and complete listing of all forms, see current SR 310-20-6. For instructions on use of these forms, see FM 9-10.

c. Field Report of Accidents.

(1) *Injury to personnel or damage to matériel.* The reports necessary to comply with the requirements of the Army safety program are prescribed in detail in the SR 385-10-40 series of special regulations. These reports are required whenever accidents involving injury to personnel or damage to matériel occur.

(2) *Ammunition.* Whenever an accident or malfunction involving the use of ammunition occurs, firing of the lot which malfunctions will be immediately discontinued. In addition to any applicable reports required in (1) above, details of the accident or malfunction will be reported as prescribed in SR 385-310-1.

d. Report of Unsatisfactory Equipment or Materials. Any suggestions for improvement in design, maintenance, safety, and efficiency of operation prompted by chronic failure or malfunction of the matériel, spare parts, or equipment or as to defects in the application or effect of prescribed lubricants and/or preserving materials will be reported through technical channels as prescribed in SR 700-45-5 to the Chief of Ordnance, Washington 25, D. C., ATTN: ORDFM, using DA Form 468, Unsatisfactory Equipment Report. Such suggestions are encouraged in order that other organizations may benefit.

Note. **Do not report all failures that occur. Report only REPEATED or RECURRENT failures or malfunctions which indicate unsatisfactory design or material. See also SR 700-45-5 and the printed instructions on DA Form 468.**

Section II. DESCRIPTION AND DATA

4. Description

The carbines are gas-operated, self-loading, air-cooled shoulder weapons, fed by 15-round or 30-round cartridge magazines. The carbines M1 and M1A1 deliver semiautomatic fire, and the carbines M2 and M3 deliver either semiautomatic or full automatic fire controlled by the operator through the use of a selector.

5. Differences Between Models

a. Tactical Inspection. For information on differences between models which affect troop use, refer to FM 23-7.

b. Cal. .30 Carbines M1 and M1A1 (figs. 1 and 2). The only difference between the carbines M1 and M1A1 is the stock. The M1 has a one-piece wooden stock, whereas the M1A1 has a folding metal stock extension and a wooden hand grip.

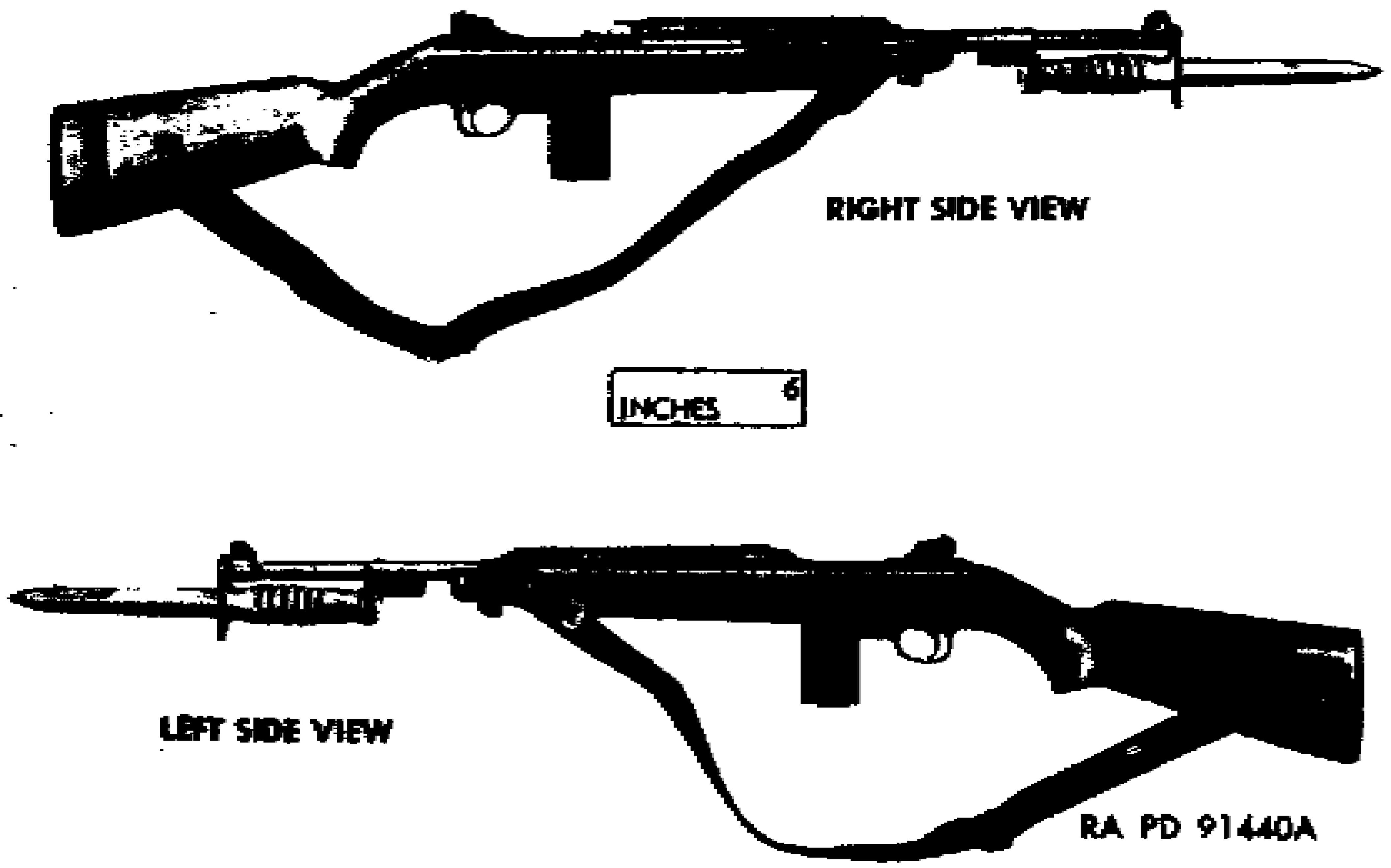


Figure 1. Cal. .30 carbine M1.

c. Cal. .30 Carbines M2 and M3 (figs. 3 and 4). The carbine M2 is the same as the M1 except for differences in design of certain components and the addition of others (*d* below), which permit the M2 to deliver either semiautomatic or full automatic fire. The carbine M3 is the same as the M2 except that the rear sight is not included and the top of the receiver is designed to accommodate special sighting

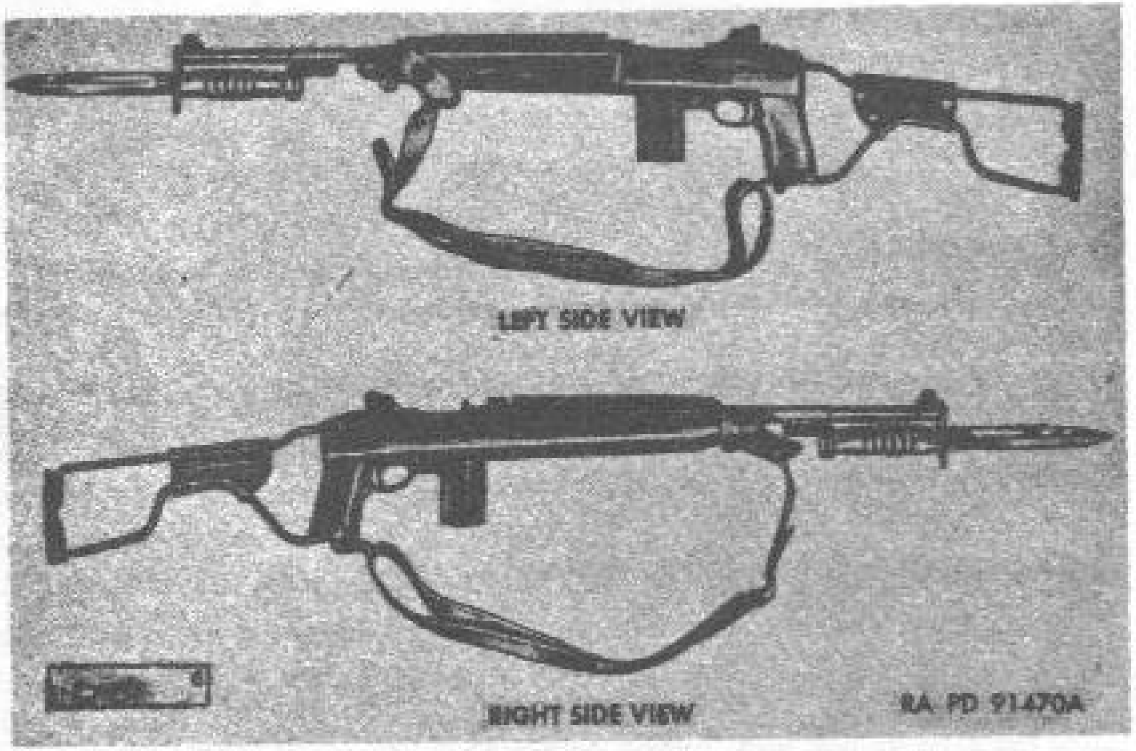


Figure 2. Cal. .30 carbine M1A1.

equipment (sniperscope) issued by the Corps of Engineers. Information on the sniperscope may be found in TM 5–9341.

d. Component Differences Between Full Automatic and Semiautomatic Carbines (fig. 5).

Note. The hammer, sear, trigger housing, operating slide, and stock of the carbine M2 (described in (1) through (5) below) can also be used on the carbine M1.

(1) *Hammer.* The hammer of the carbine M2 is the same as the hammer of the M1 carbine, except that it has a milled cut in the lower right side to furnish clearance for the disconnector when assembled on the hammer pin (fig. 49).

(2) *Sear.* The sear (fig. 52) of the carbine M2 is the same as the sear of the carbine M1, except for a raised shoulder on the top of the front end, which forms a camming surface for the disconnector when operated.

(3) *Trigger housing.* The trigger housing of the carbine M2 is the same as that of the carbine M1, except that the left side of the magazine post is furnished with a retention slot, and the front face of the post with a dismounting notch for the selector spring. (The dismounting notch leads into the top of the slot.) The right side has a milled cut for clearance of the disconnector lever. The left side has a milled cut for the selector.

(4) *Operating slide.* The operating slide (fig. 58) of the carbine M2 is the same as that of the carbine M1, except for a clearance cut extending along the right-hand side of the body, and a diagonal cut at the point where the shank of the



Figure 3. Cal. .30 carbine M2.

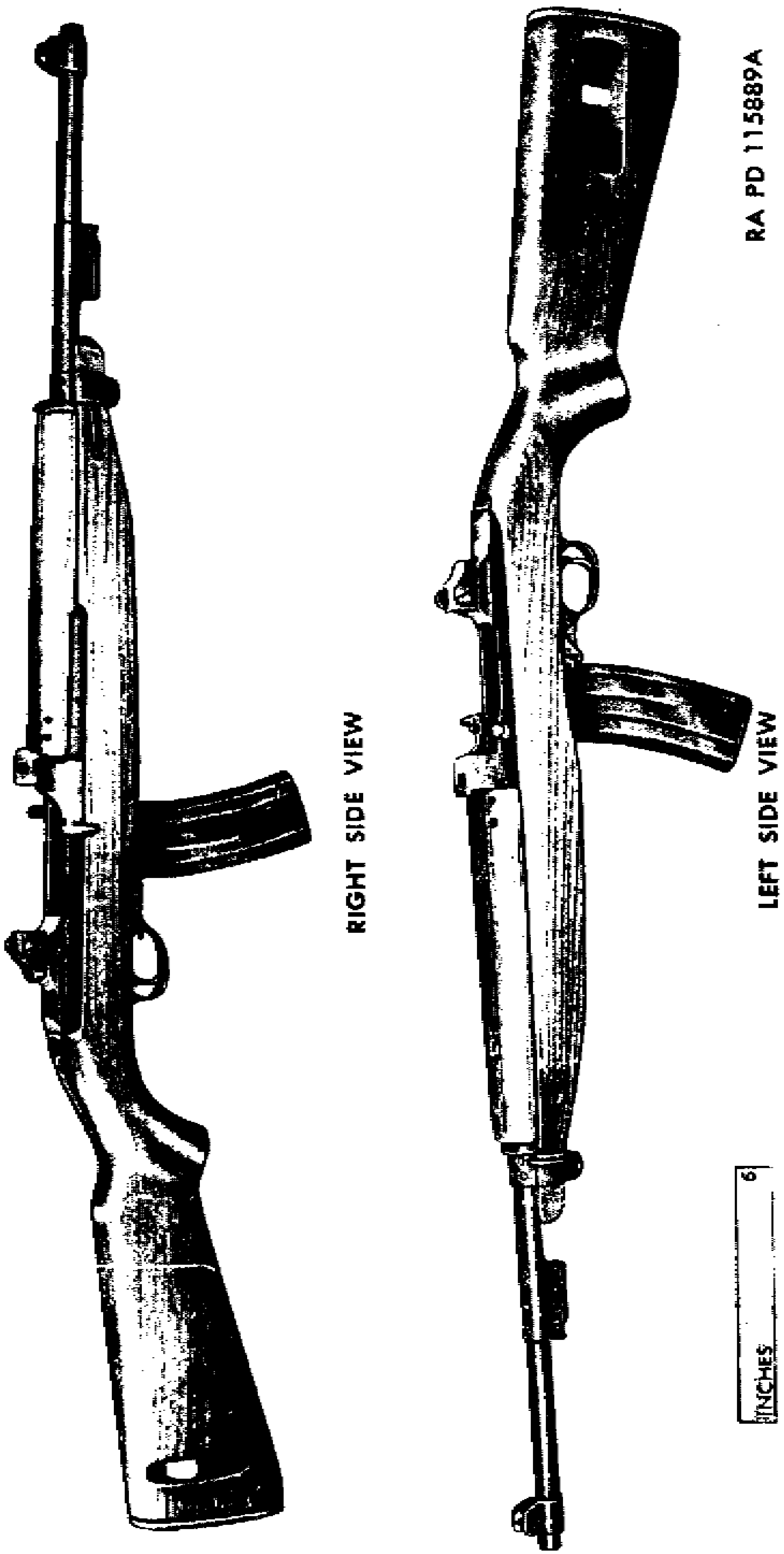


Figure 4. Cal. .30 carbine M3.

handle joins the body. The latter cut forms a cam for camming down the forward end of the disconnector lever.

(5) *Stock* (fig. 99). A clearance cut is made in the inner right wall of the M2 carbine to provide clearance for the projecting right side of the disconnector. A cut is also made in the inner left wall for clearance for the selector. The bridge is cut down to the central section for clearance for the disconnector lever.

(6) *Disconnector group—added parts* (fig. 56). The disconnector pivots on the hammer pin when assembled. The rear end has a lateral projection, which bears upon the raised shoulder of the sear, when the disconnector is cam-operated by the disconnector lever for full automatic fire. The forward end has a projecting lug on the right side, which extends outside the trigger housing and engages and acts as a camming surface for the rear end of the disconnector lever. A spring and a plunger, recessed in the top of the disconnector and bearing on the receiver, return the disconnector to the inoperative position, when the camming action of the lever is discontinued.

(7) *Disconnector lever assembly—added parts* (fig. 56). The disconnector lever assembly is not to be disassembled. Replace the lever assembly if any part is found to be defective. The disconnector lever assembly is composed of a disconnector lever pin, disconnector lever rivet, and disconnector lever. The pin retains the trigger housing when assembled to the receiver. The disconnector lever, riveted to a pivot on the pin, is shifted in a vertical plane, by the turning of the pin. The pin is turned by the selector. A rounded projection on the rear end of the disconnector lever operates the disconnector. A projecting toe on the front end of the disconnector lever contacts the camming surface on the operating slide. An offset in the rear section provides for alinement with the disconnector.

(8) *Selector group—added parts* (fig. 56). The selector is mounted to the left end of the crank pin by means of a slot in the lower forward face of the selector mating the straddle slots in the end of the pin. The selector holds the pin in position and acts as a lever for turning, throwing the disconnector lever into or out of engagement with the operating slide. A curved wire spring holds the selector in position on the pin and in the full automatic or semiautomatic position when operated. The straight front end of the spring seats into a recess in the lower rear end of the selector, and the circular rear end of the spring seats in a vertical slot in the front



Figure 5. Operating parts for carbines M2 and M3.

face of the magazine post on the left side of trigger housing. When assembled, the circular end of the spring is downward (spring is concave downward).

6. Tabulated Data

Weight of carbines M1, M2, and M3 (without sniperscope) with 15-round magazine (unloaded)	5.50 lb.
Weight of carbine M1A1, with 15-round magazine (unloaded)	6.19 lb.
Weight of carbines M1, M2, and M3 (without sniperscope) with 15-round magazine (loaded) and sling	6.10 lb.
Weight of carbine M1A1 with 15-round magazine (loaded) and sling	6.79 lb.
Weight of carbines M2 and M3 (without sniperscope) with 30-round magazine (unloaded)	5.53 lb.
Weight of carbines M2 and M3 (without sniperscope) with 30-round magazine (loaded)	6.60 lb.
Magazine capacity (old type)	15 rd.
Magazine capacity (new type)	30 rd.
Weight of 15-round magazine (unloaded)	0.17 lb.
Weight of 15-round magazine (loaded)	0.59 lb.
Weight of 30-round magazine (unloaded)	0.23 lb.
Weight of 30-round magazine (loaded)	1.07 lb.
Over-all length of carbines M1, M2, and M3	35.58 in.
Over-all length of carbine M1A1 (stock extension extended)	35.63 in.
Over-all length of carbine M1A1 (stock extension folded)	25.51 in.
Over-all length of carbines M1, M2, and M3 with bayonet attached	42.26 in.
Over-all length of carbine M1A1 with bayonet attached (stock extended)	42.31 in.
Weight of 100 cartridges	2.8 lb.
Weight of 1 ball cartridge	193 gr.
Weight of bullet (aprx)	111 gr.
Muzzle velocity	1,900–2,000 f. p. s.
Pressure in chamber per square inch maximum (aprx)	40,000 lb.
Maximum range	2,000 yd.
Effective range	300 yd.
Rate of fire, full automatic (M2 and M3)	750–775 r. p. m.
Length of barrel	18.00 in.
Sight radius at 100 yards	21.5 in.

Trigger pull	4½–7 lb.
Shipping weight of nailed wood box containing 10 carbines M1, M2, or M3 (without sniperscope)	98 lb.
Shipping weight of nailed wood box containing 10 carbines M1A1	90 lb.
Dimensions (outside) of nailed wood box containing 10 carbines M1, M2, or M3 (without sniperscope)	40¾ x 17 x 11¾
Dimensions (outside) of nailed wood box containing 10 carbines M1A1	30½ x 19½ x 10¼
Cubical displacement of nailed wood box containing 10 carbines M1, M2, or M3 (without sniperscope)	4.7 cu. ft.
Cubical displacement of nailed wood box containing 10 carbines M1A1	3.5 cu. ft.
Ballistics of cartridge	(FM 23–7)

Note. 7,000 grains equal 1 pound avoirdupois measure.

CHAPTER 2

PARTS, SPECIAL TOOLS, AND EQUIPMENT FOR FIELD AND DEPOT MAINTENANCE

7. General

Tools and equipment and maintenance parts over and above those available to the using organization are supplied to ordnance field maintenance units and depot shops for maintaining, repairing, and/or rebuilding the matériel.

8. Parts

Maintenance parts are listed in Department of the Army Supply Catalog ORD 8 SNL B–28 which is the authority for requisitioning replacements. Parts not listed in an ORD 8 catalog but required by depot shops in rebuild operation may be requisitioned from the listing in the corresponding ORD 9 catalog and will be supplied if available. Requisition for ORD 9 parts will contain a complete justification of requirements.

9. Common Tools and Equipment

Standard and commonly used tools and equipment having general application to this matériel are authorized for issue by T/A and T/O&E.

10. Special Tools and Equipment and Improvised Tools

a. Special Tools and Equipment. The special tools and equipment tabulated in table I are listed in Department of the Army Supply Catalog ORD 6 SNL J–12. This tabulation, containing only those special tools and equipment necessary to perform the operations described in this manual, is included for information only and is not to be used as a basis for requisitions.

Note. Special tool sets in ORD 6 SNL J–12 also contain standard and commonly used tools and equipment specifically applicable to this matériel.

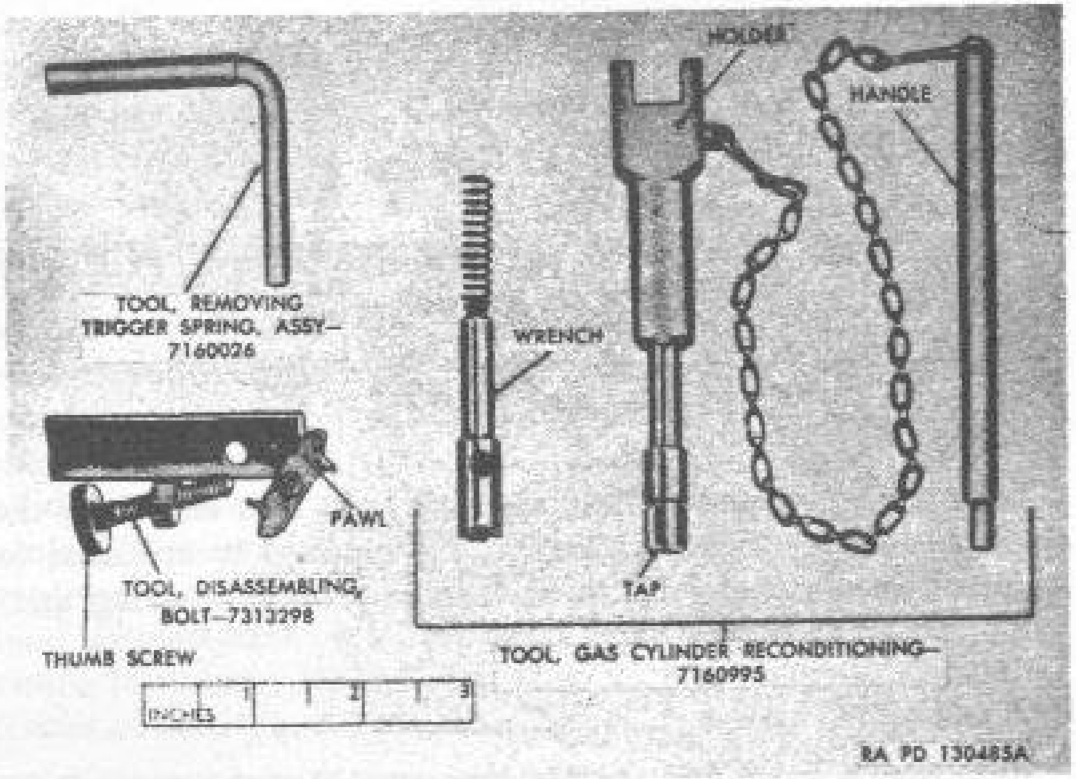


Figure 6. Special tools.

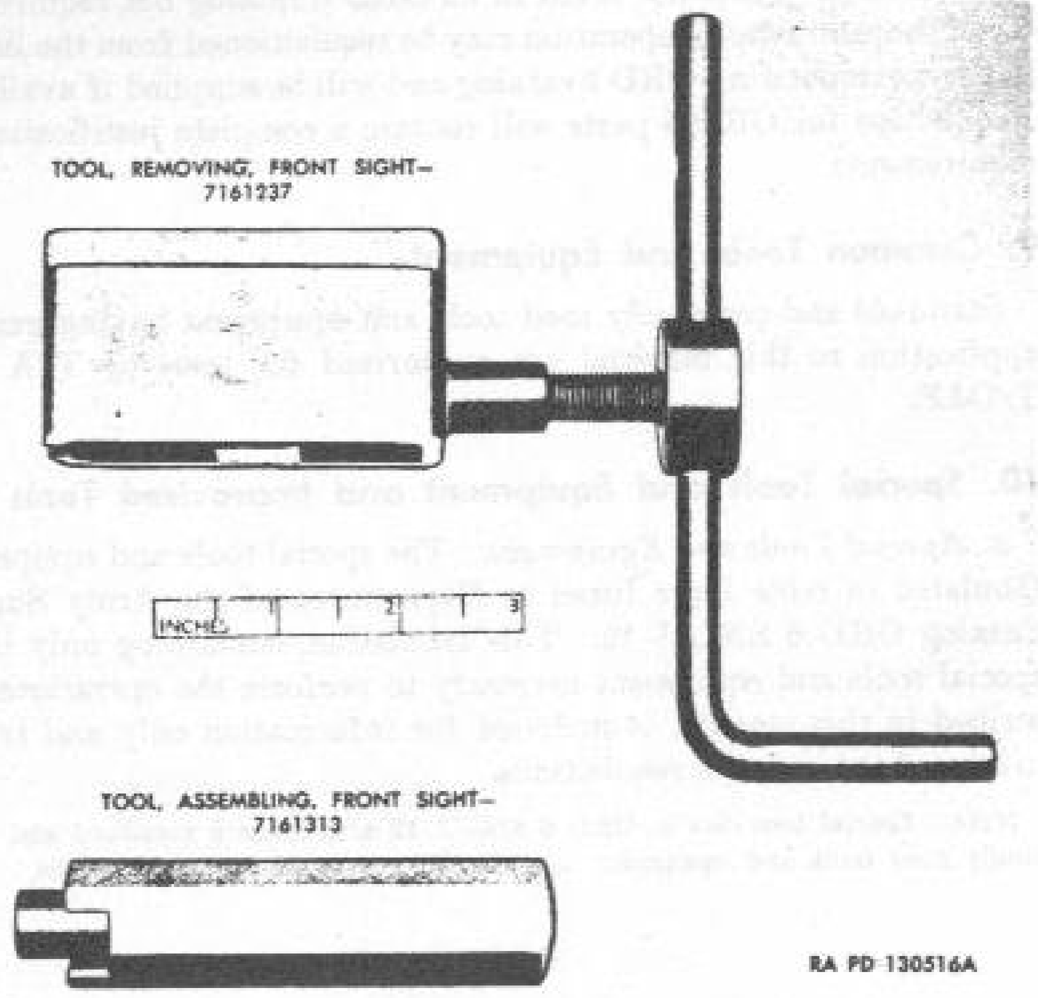


Figure 7. Front sight tools.

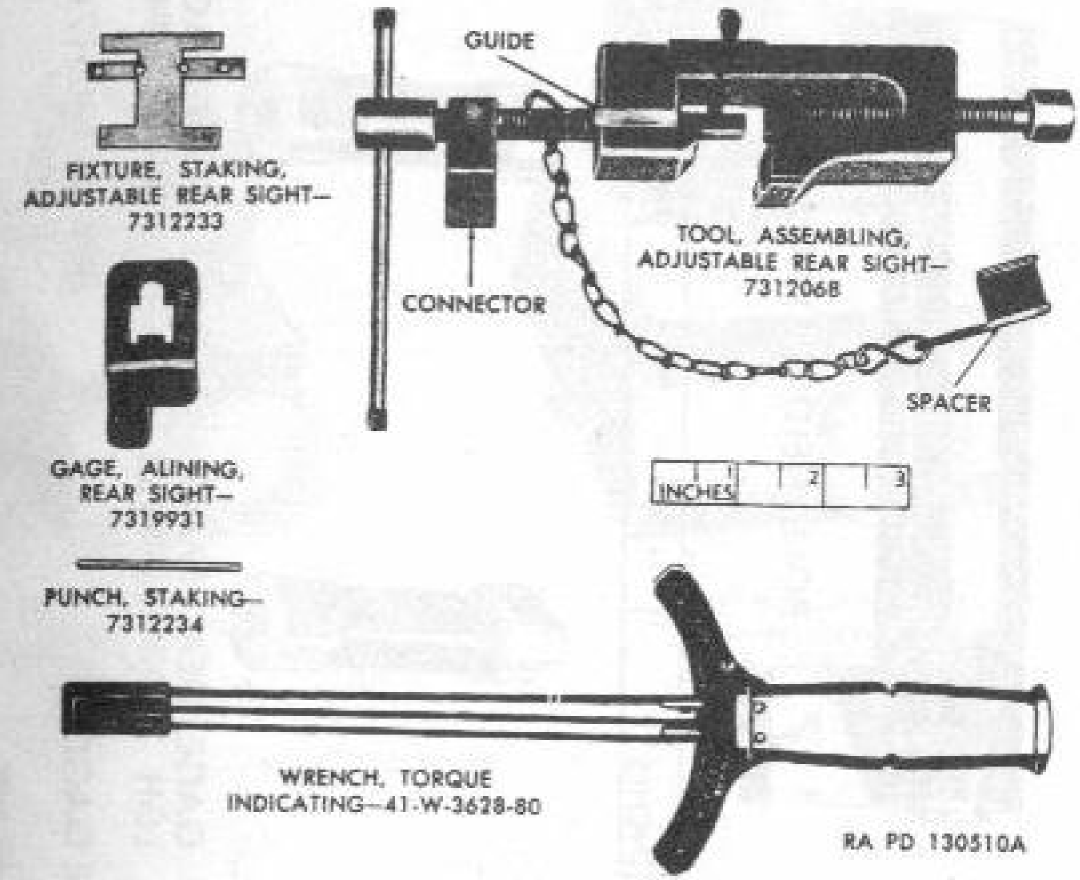


Figure 8. Rear sight tools.

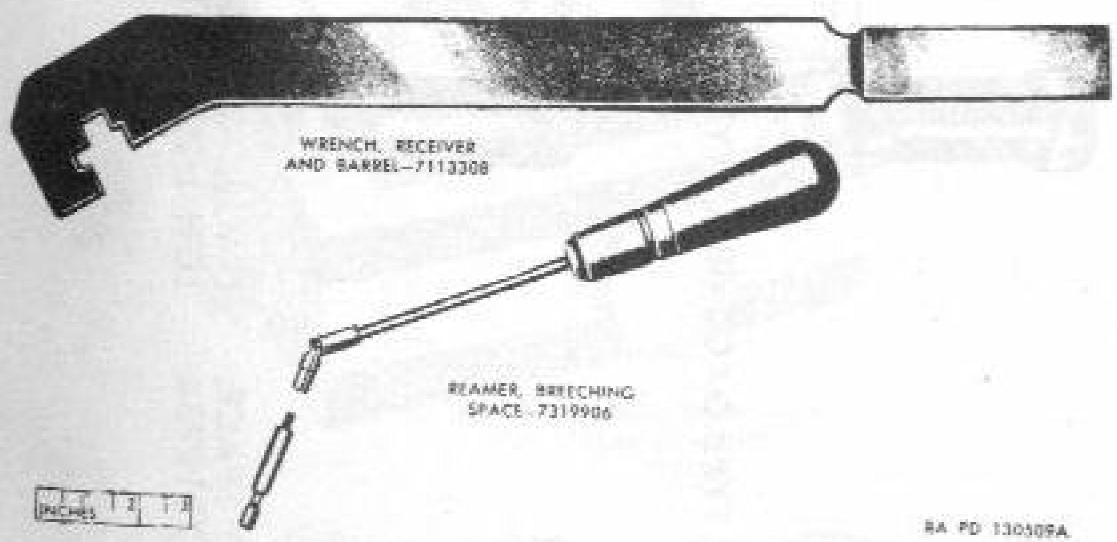


Figure 9. Special tools.

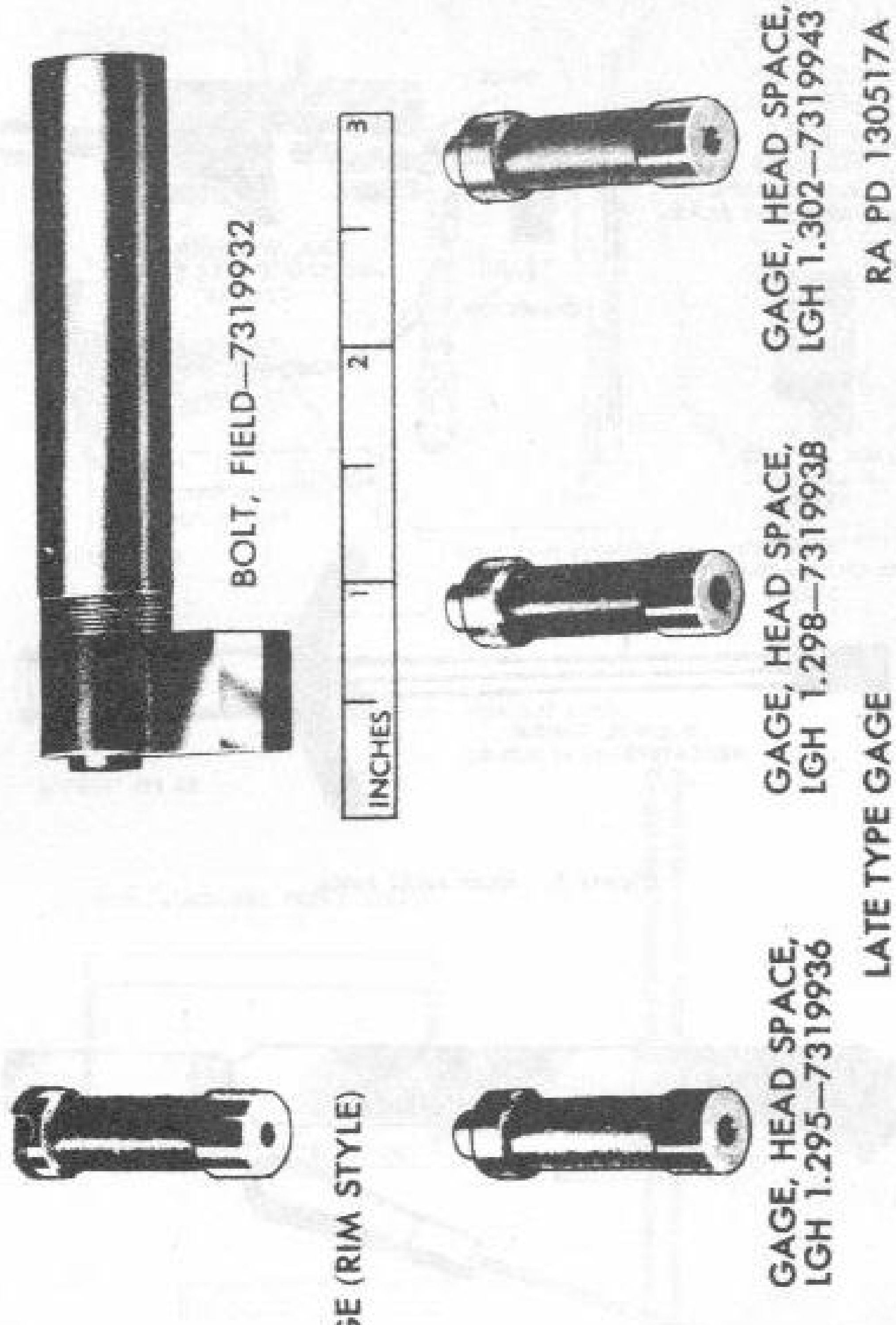


Figure 10. Special tools.

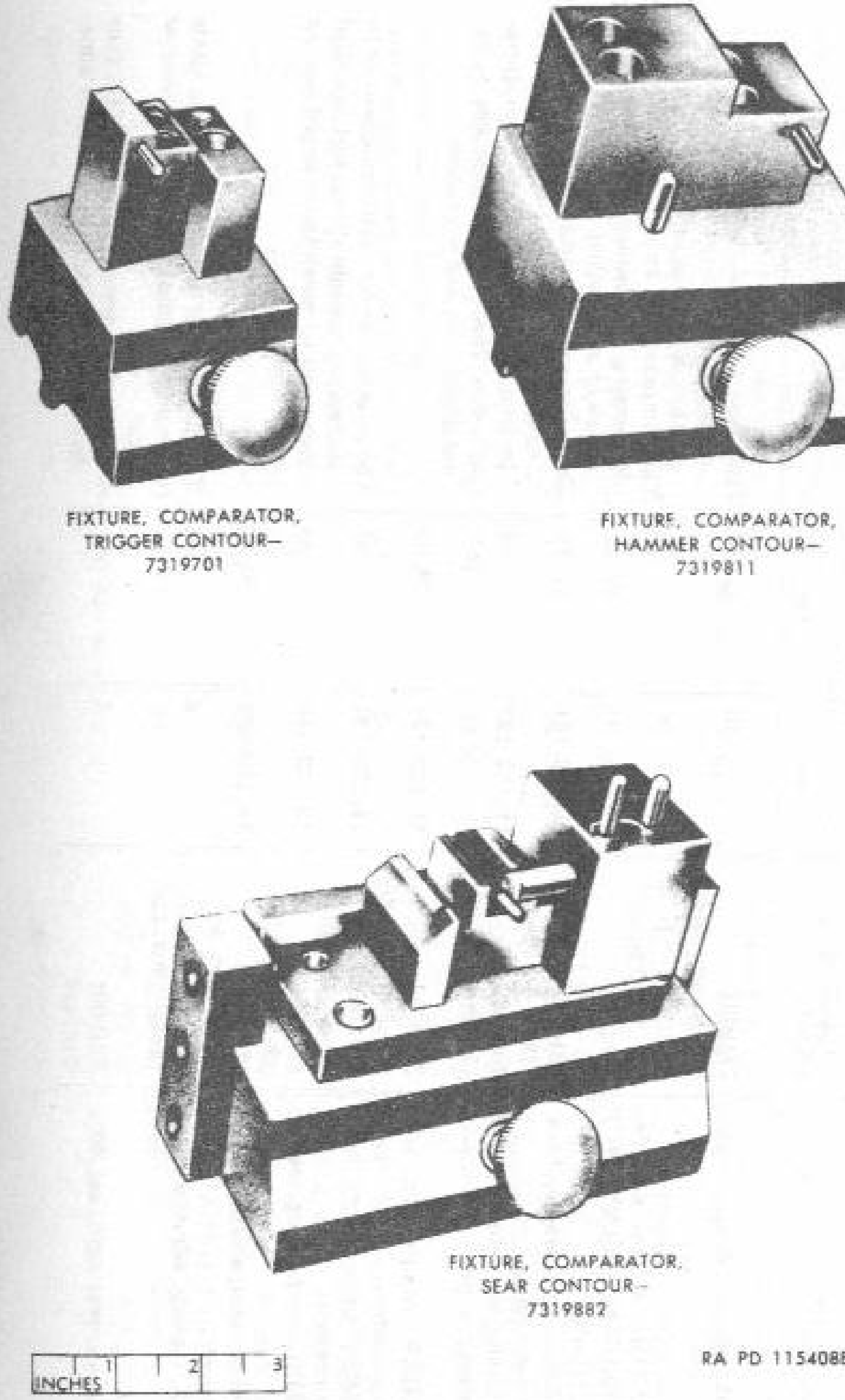


Figure 11. Comparator fixtures.

Table I. Special Tools and Equipment for Field and Depot Maintenance

Item	Identifying No.	References		Use
		Fig.	Par.	
BOLT, field test, cal. .30	7319932 (41-B-1586-990)	10	57*d*	Field test bolt used to check head space instead of component bolt to determine whether deviations are due to wear.
COMPARATOR, screens and fixtures (DEPOT MAINTENANCE ONLY) includes:				The comparator is an optical machine for measuring or comparing objects by means of a magnified shadow.
FIXTURE, comparator, hammer contour.	7319811 (18-F-41075-40)	11, 128-131	85	These fixtures are used to hold the components in the correct position for comparison of enlarged shadow on corresponding chart for conformance to established lines and tolerances.
FIXTURE, comparator, sear contour.	7319882 (18-F-41075-70)	11, 122-127	84	
FIXTURE, comparator, trigger contour.	7319701 (18-F-41075-90)	11, 119-121	78, 83	
SCREEN, comparator, hammer contour.	(7317839) 18-S-1499-40	12, 128-131	85	The screens, one for each component to be inspected, contain lines and specified tolerances to which the enlarged shadow must conform.
SCREEN, comparator, sear	(7317840) 18-S-1499-70	13, 122-127	84	
SCREEN, comparator, trigger contour.	(7317838) 18-S-1409-90	14, 119-121	80, 83	
FIXTURE, staking, adjustable rear sight.	7312233 (41-F-2997-358)	8	55*k*	The fixture is a template used to locate the points of staking for adjustable rear sight.
GAGE, alining, rear sight, cal..30	7319931 7161446 (41-G-13-327)	8	----------	Gage used as template on old "L" type sight equipped carbines to scribe alinement mark for installation of adjustable type sight.
GAGE, head space, cal..30, head space lgh 1.290 in.	7319934 (41-G-199-175)	10, 83	14, 57*d*, 58*d*	Gage to check the minimum head space.
GAGE, head space, cal..30, head space lgh 1.295 in (DEPOT MAINTENANCE ONLY).	7319936 (41-G-199-180)	10	14, 57*d*	Gage to check maximum head space with field test bolt (after carbine has been rebarreled).
GAGE, head space, cal..30, head space lgh 1.298 in.	7319938 (41-G-199-185)	10	14, 57*d*	Gage to check maximum limit head space for weapons in stock.
GAGE, head space, cal..30, head space lgh 1.302 in (FOR FIELD MAINTENANCE ONLY).	7319943 (41-G-200-5)	10, 83	57*d*	Gage to check maximum head space of weapons in hands of troops, domestic and oversea.
PUNCH, staking, size ⅛ x 2 in, diam of pt 0.005 in.	7312234 (41-P-3848-950)	8, 73	55	The punch is used for staking the receiver to hold the adjustable rear sight in place.
REAMER, carb-S, breeching space, carbine, cal..30, complete (DEPOT MAINTENANCE ONLY).	7319906 (41-R-488-125)	9, 85	58*d*	The reamer is used to ream cartridge chamber to obtain correct head space with a new barrel.
TOOL, assembling, adjustable rear sight, carbine cal..30.	7312068 (41-T-3016-125)	8, 68, 69, 70	52, 55	Tool used to remove and install (or replace) adjustable rear sight.
TOOL, disassembling, bolt	7313298 (41-T-3019-625)	6, 60	43, 45	Tool used to disassemble and assemble bolt.
TOOL, assembling, front sight	7161313 (41-T-3017-625)	7, 65	50	Tool used to install (or replace) front sight on barrel.
TOOL, gas cylinder reconditioning	7160995 (41-T-3164)	6, 77, 84	56*b*, 58, 59	Tool used to remove and install (or replace) gas cylinder piston nut; and to recondition the threads in gas cylinder.
TOOL, gas piston nut removing, M5	5621065 (41-T-3165)	----------	56*b*	Tool used to remove and install (or replace) the gas cylinder piston nut.
TOOL, removing, front sight	7161237 (41-T-3318-500)	7, 63	47	Tool used to remove front sight from barrel.

Table I. Special Tools and Equipment for Field and Depot Maintenance—Continued

Item	Identifying No.	References: Fig.	References: Par.	Use
TOOL, removing, trigger spring, assy.	7160026 (41-T-3318)	6, 46	28-31	Tool used to remove and install (or replace) trigger spring.
WRENCH, receiver and bbl (DEPOT MAINTENANCE ONLY).	7113308 (41-W-1998-765)	9, 76, 92	56, 59	Wrench is used to remove barrel from, and to install barrel on receiver.
WRENCH, torque indicating, ¼ in sq-drive, cap 60 in-lb in metal case.	(41-W-3628-80)			Torque wrench is used in conjunction with rear sight assembling tool 7312068 in order to measure pressure required to position adjustable rear sight.
Consisting of:				
1 Case, metal	(41-C-465-75)			
1 Wrench, torque indicating	(41-W-3628-85)	8, 70	55	

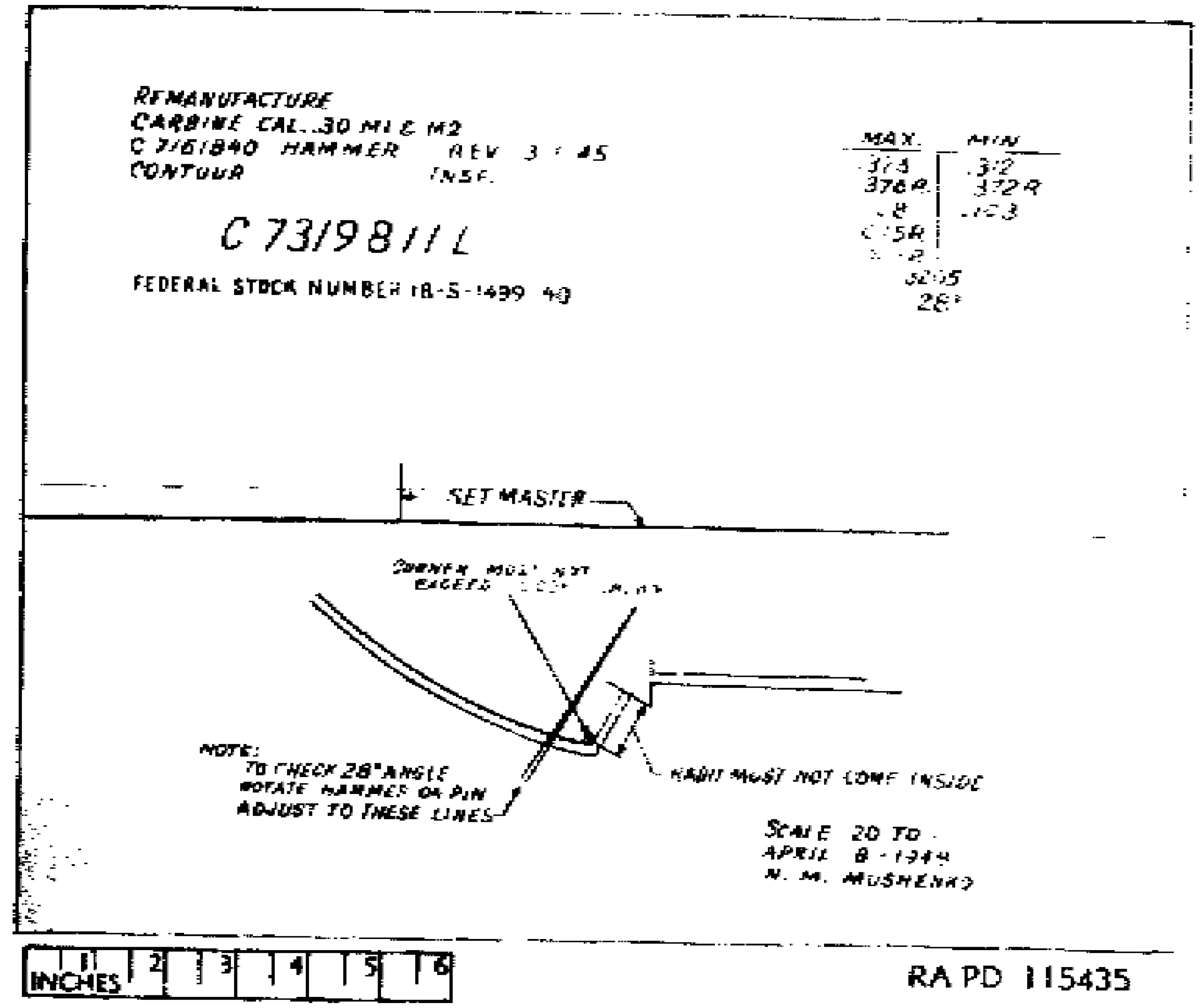


Figure 12. Comparator screen 7317839 for hammer.

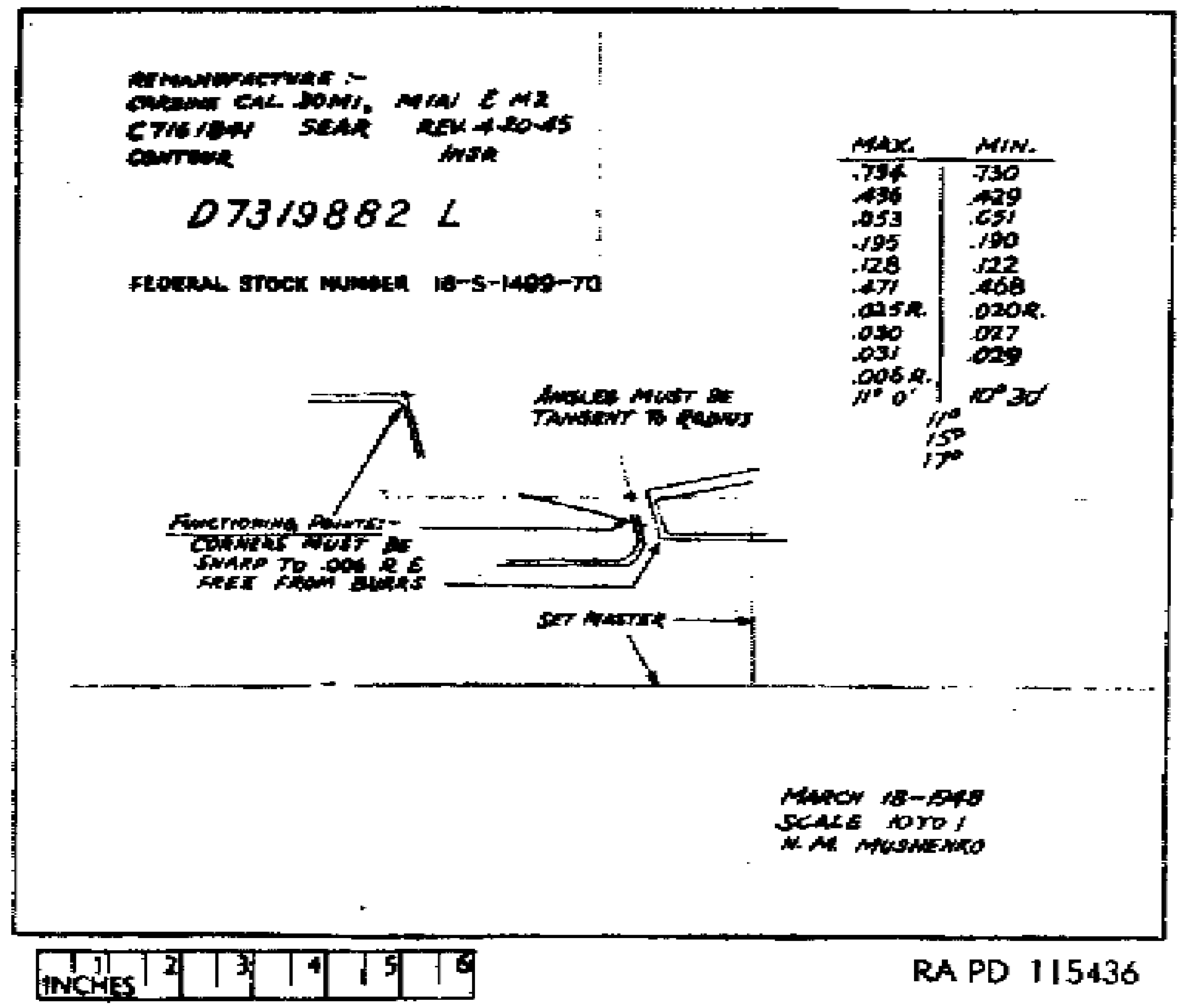


Figure 13. Comparator screen 7317840 for sear.

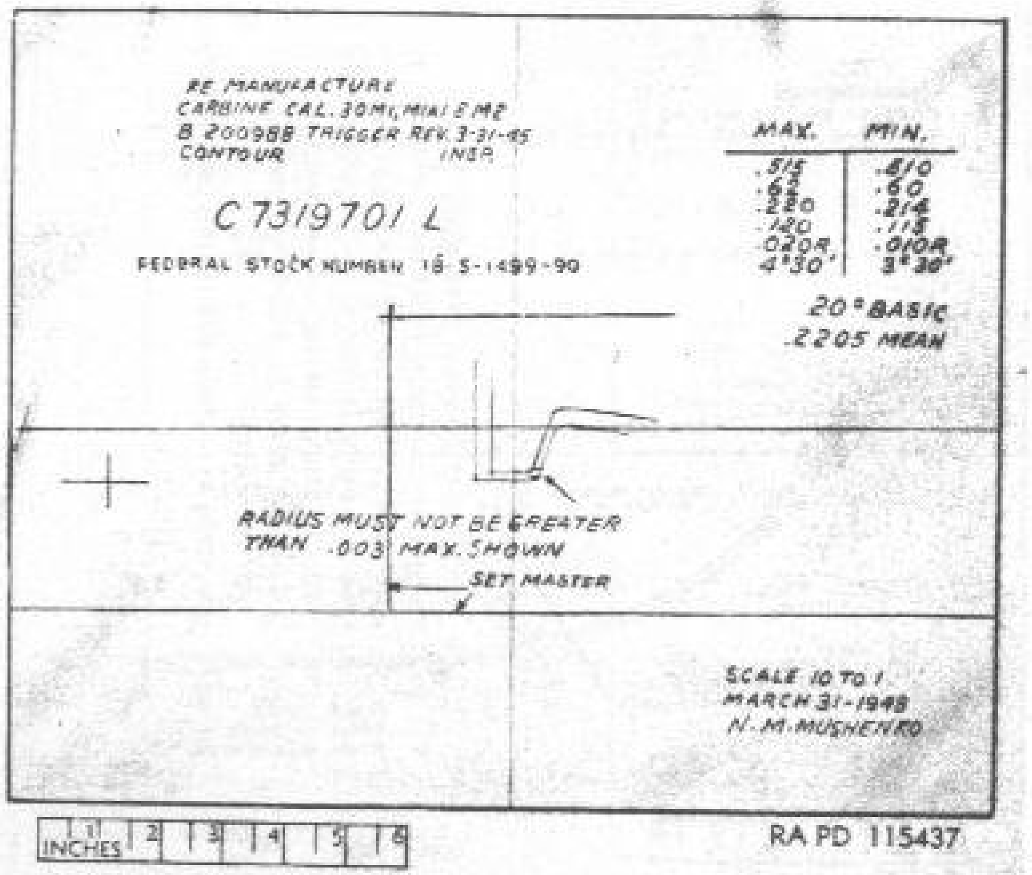


Figure 14. Comparator screen 7317838 for trigger.

b. Improvised Tools. The dimensioned detail drawings of the improvised tools listed in table II are furnished to enable field and depot maintenance organizations to fabricate these tools locally if desired. The chief value of these tools is to assist maintenance organizations engaged in rebuilding a large number of weapons. These tools are not essential for rebuild and are not available for issue; the data is furnished for information only.

Table II. Improvised Tools for Field and Depot Maintenance

Item	References		Use
	Fig.	Par.	
FIXTURE, stamping, vise-held.	15–23, 88, 89	58e	Used to hold receiver when stamping serial number.
FIXTURE, stamping, bench-mounted.	24–34, 90, 91	58e	Used to hold receiver when stamping serial number.
TOOL, chamfering, muzzle	35	58f	Used to counterbore muzzle of barrel.

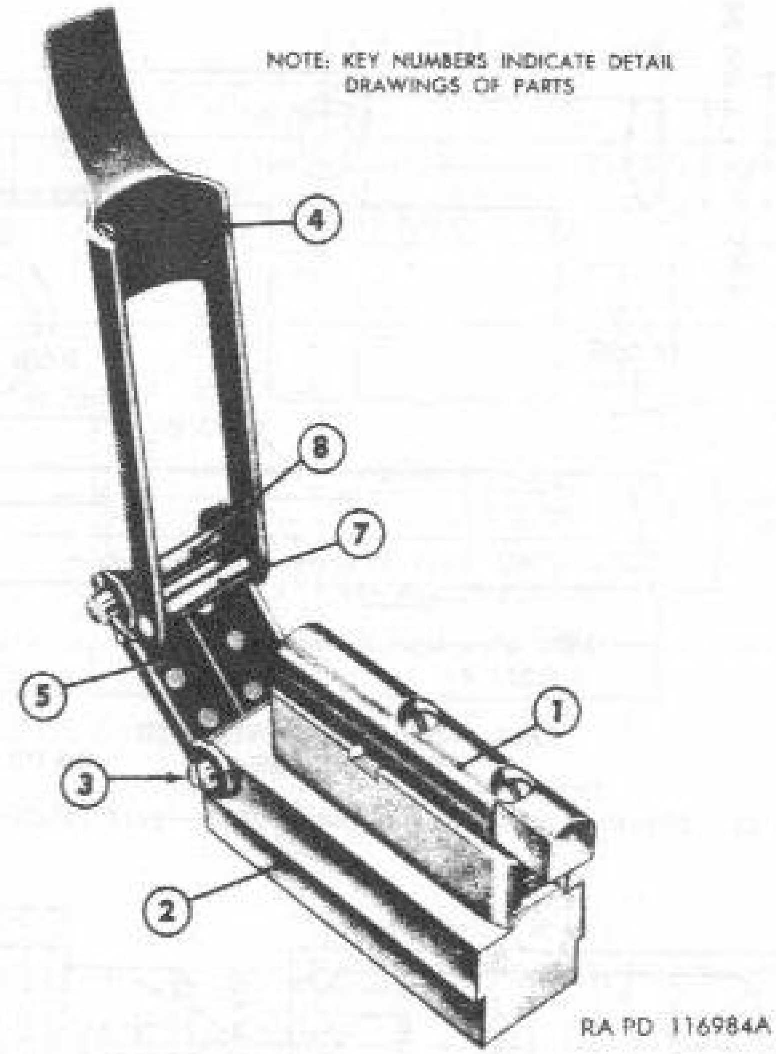


Figure 15. Vise-held stamping fixture—front view.

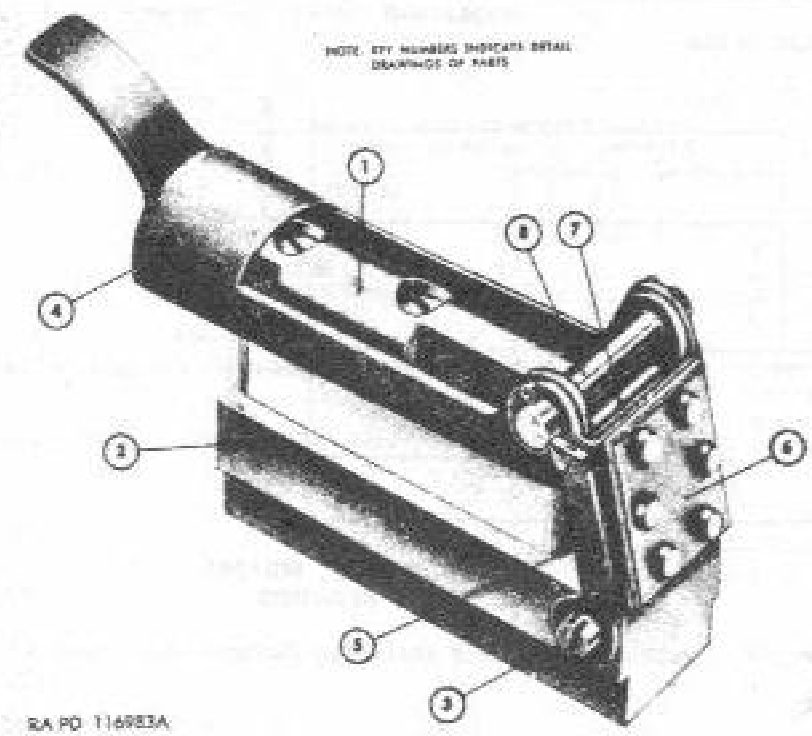
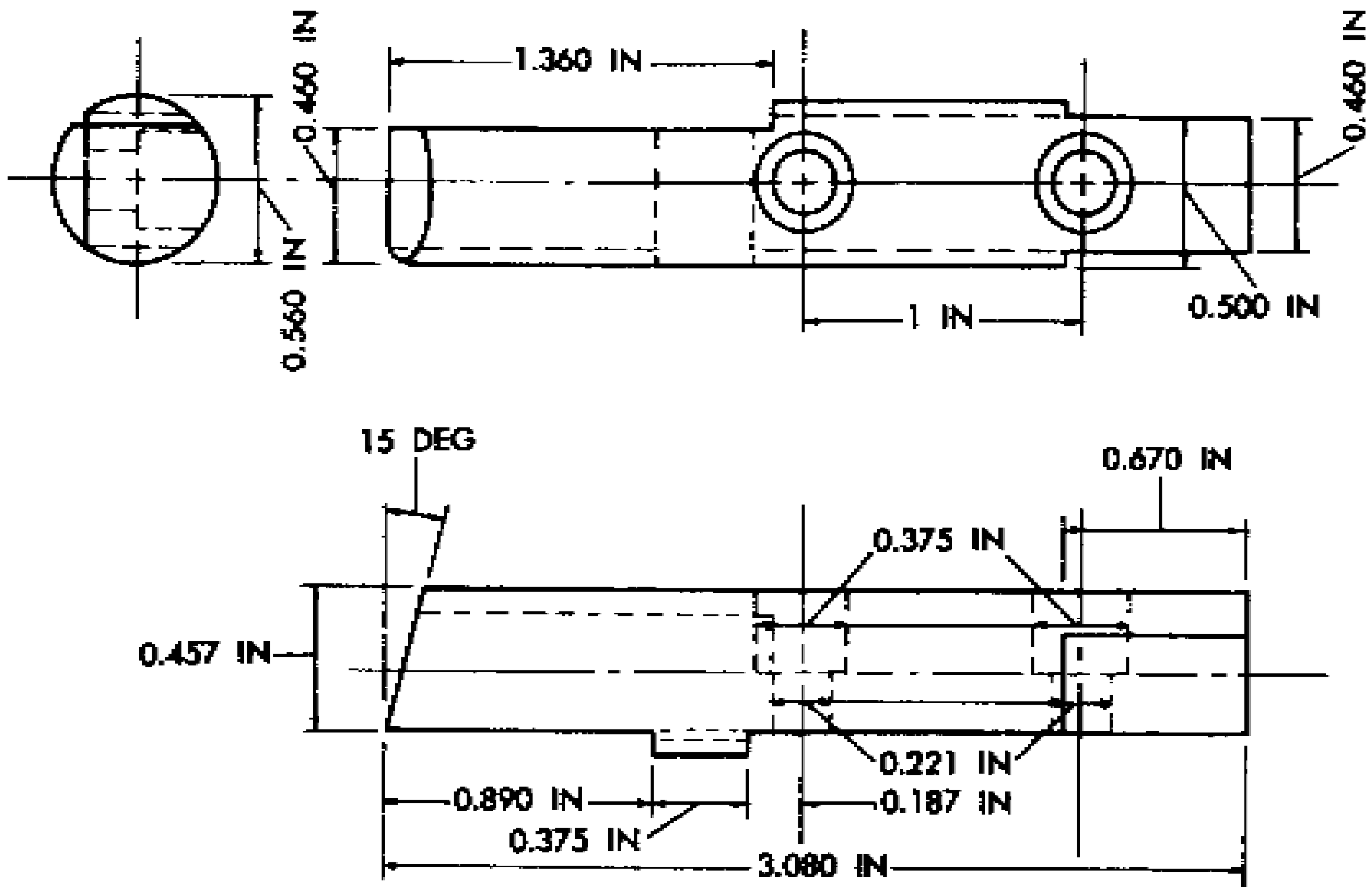
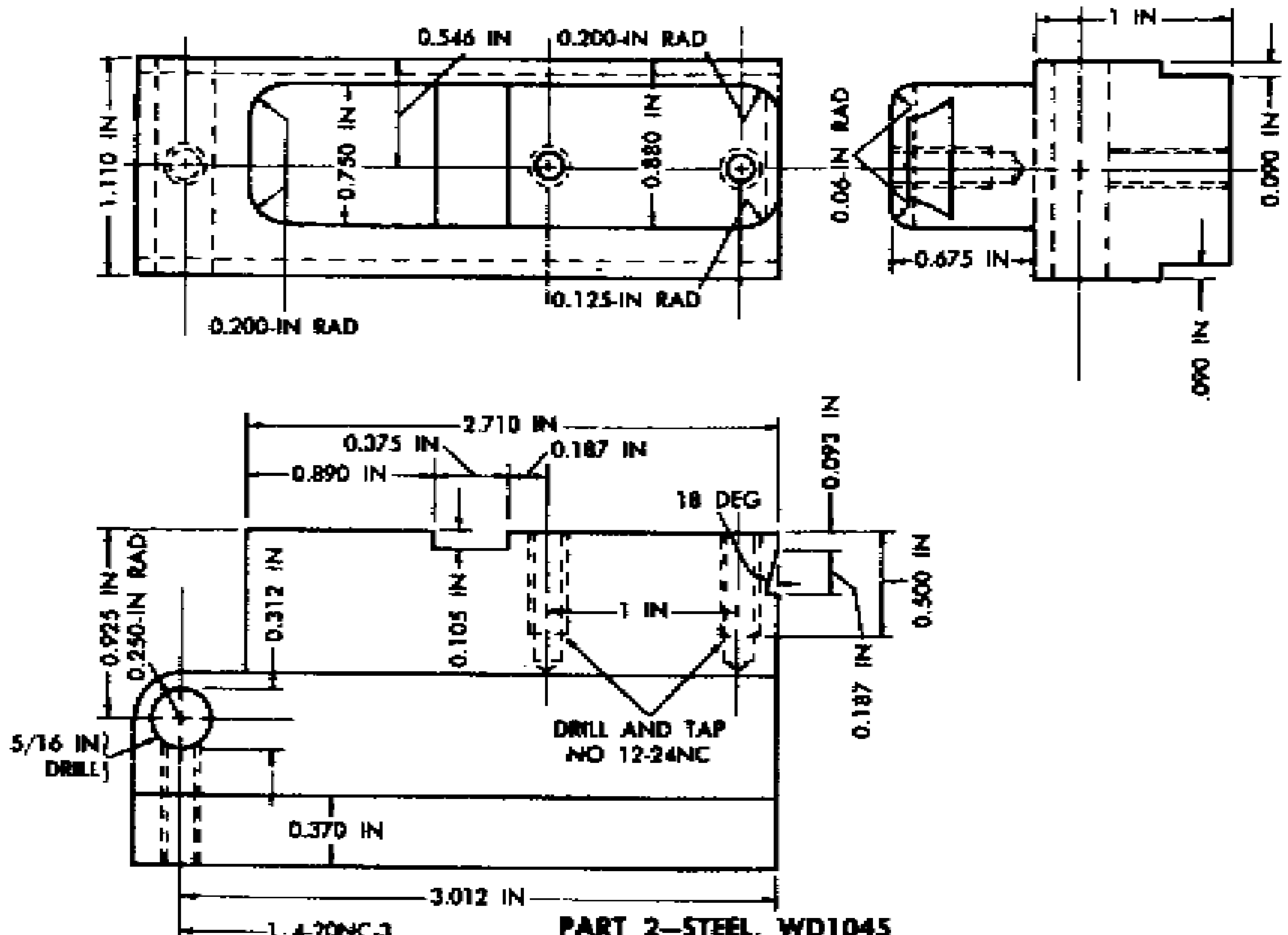


Figure 16. Vise-held stamping fixture—rear view.



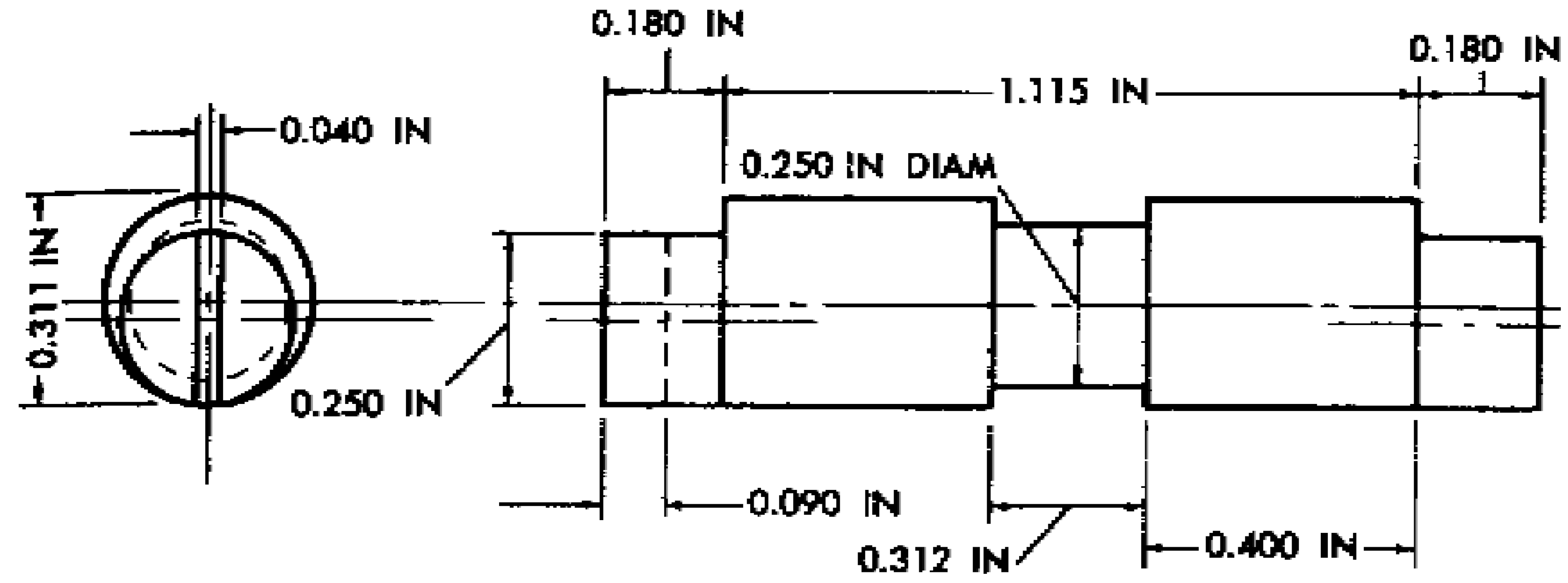
PART 1—DRILL ROD, UNTREATED
ONE REQUIRED RA PD 116988A

Figure 17. Detail of vise-held stamping fixture—part number 1.



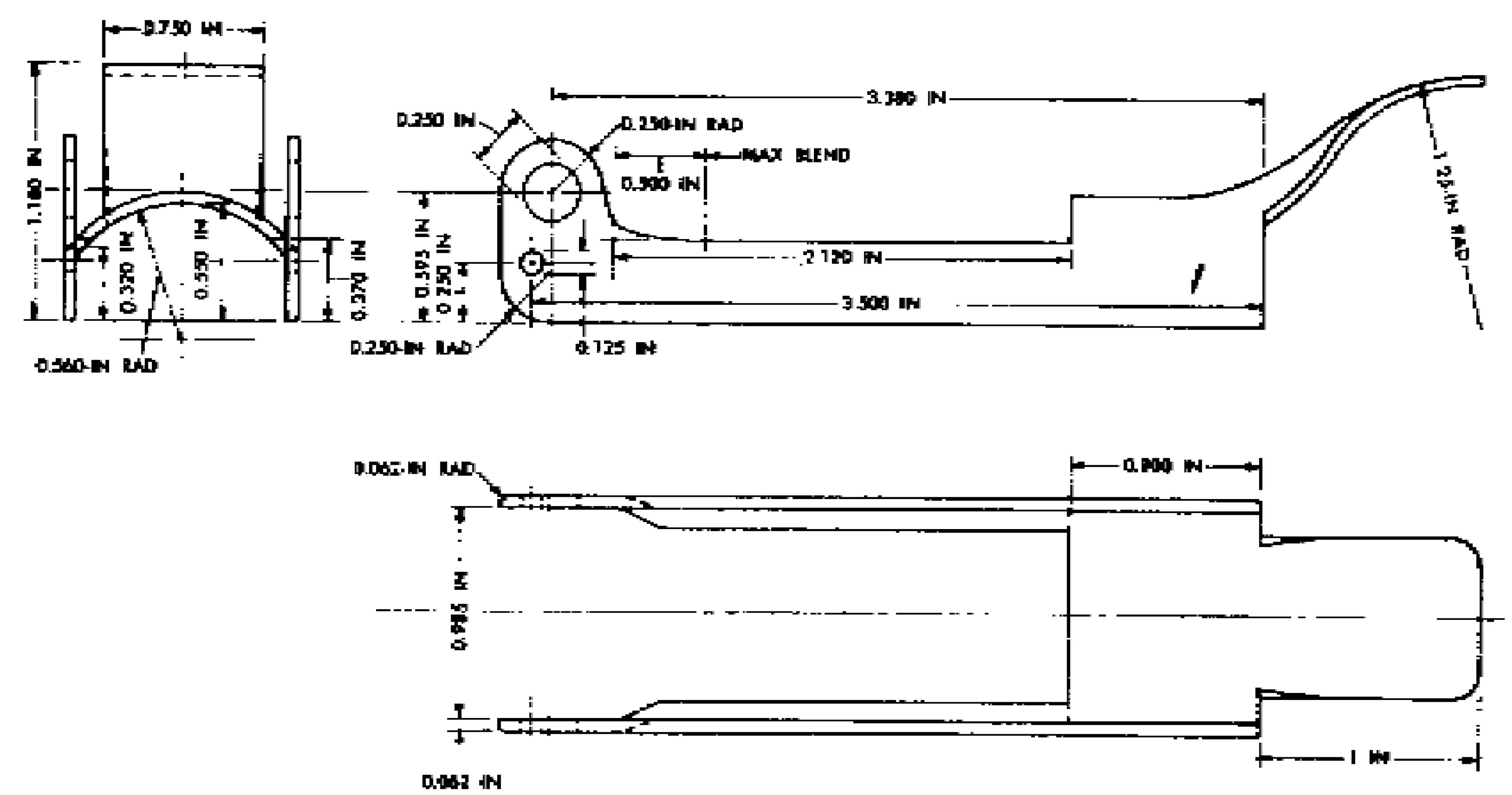
PART 2—STEEL, WD1045
ONE REQUIRED RA PD 116989

Figure 18. Detail of vise-held stamping fixture—part number 2.



PART 3—DRILL ROD, UNTREATED
ONE REQUIRED RA PD 116990

Figure 19. Detail of vise-held stamping fixture—part number 3.



PART 4—STEEL WD 1085 HARDEN AND SPRING TEMPER—ROCKWELL C45-48
ONE REQUIRED RA PD 116991

Figure 20. Detail of vise-held stamping fixture—part number 4.

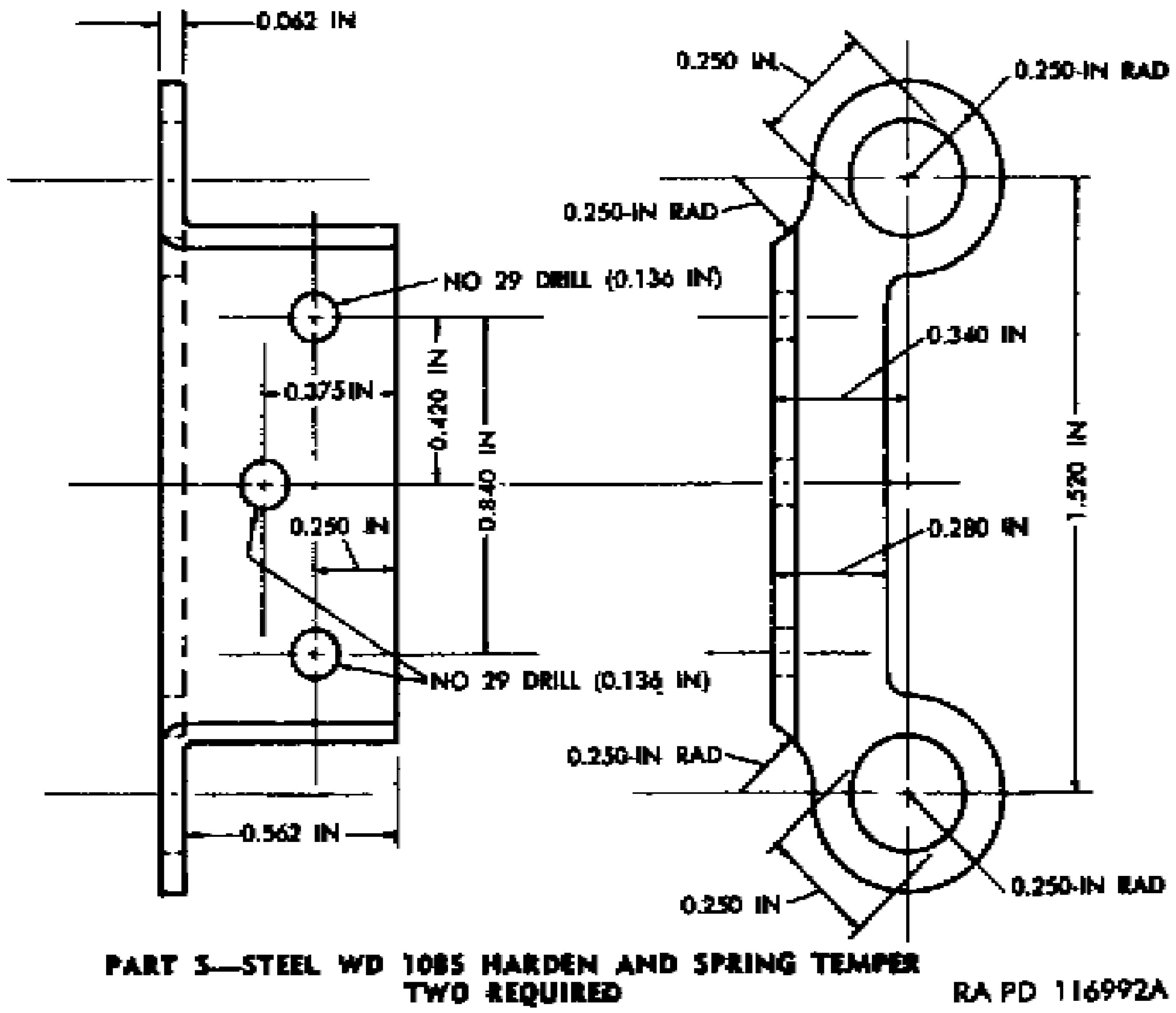


Figure 21. Detail of vise-held stamping fixture—part number 5.

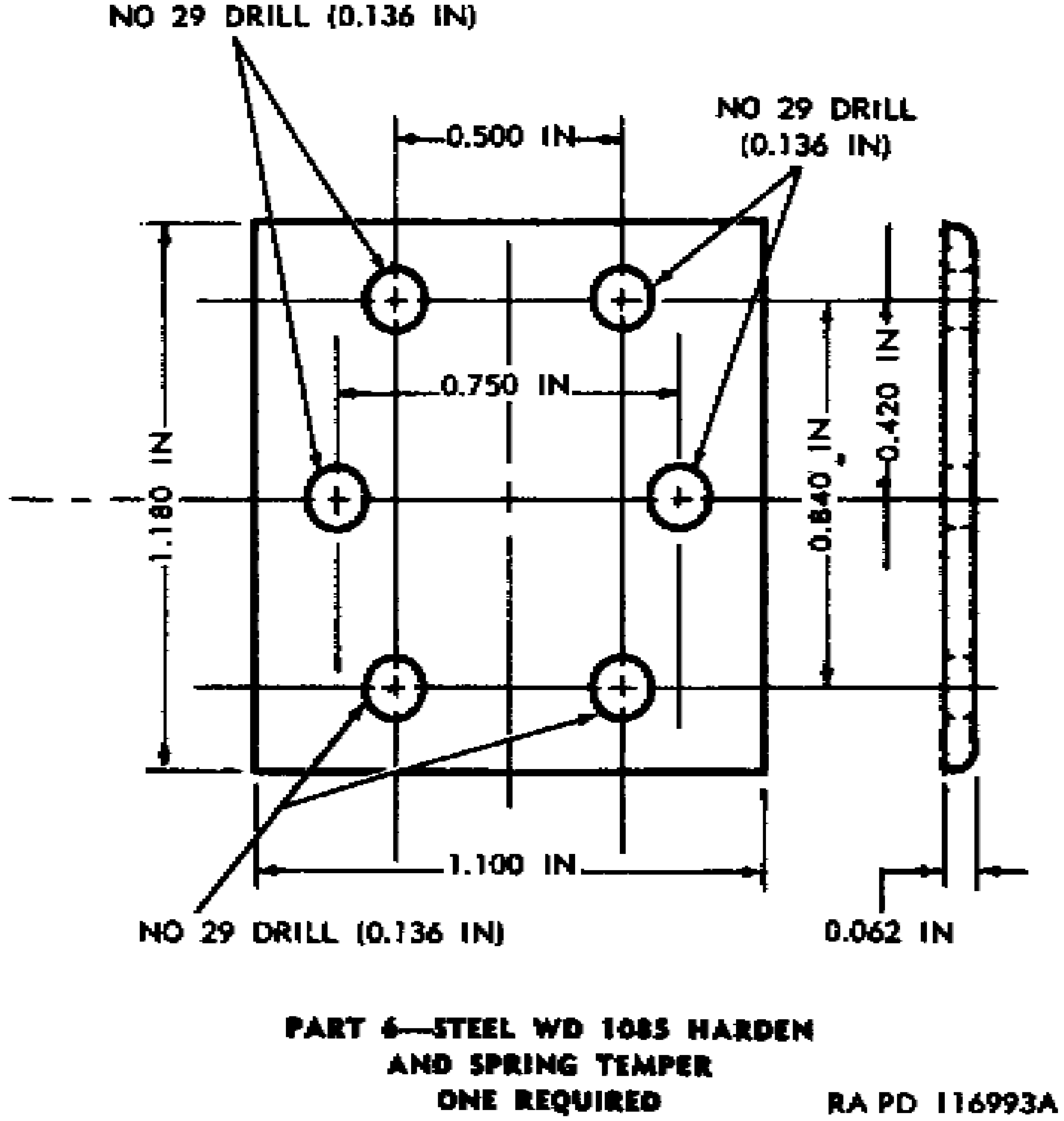


Figure 22. Detail of vise-held stamping fixture—part number 6.

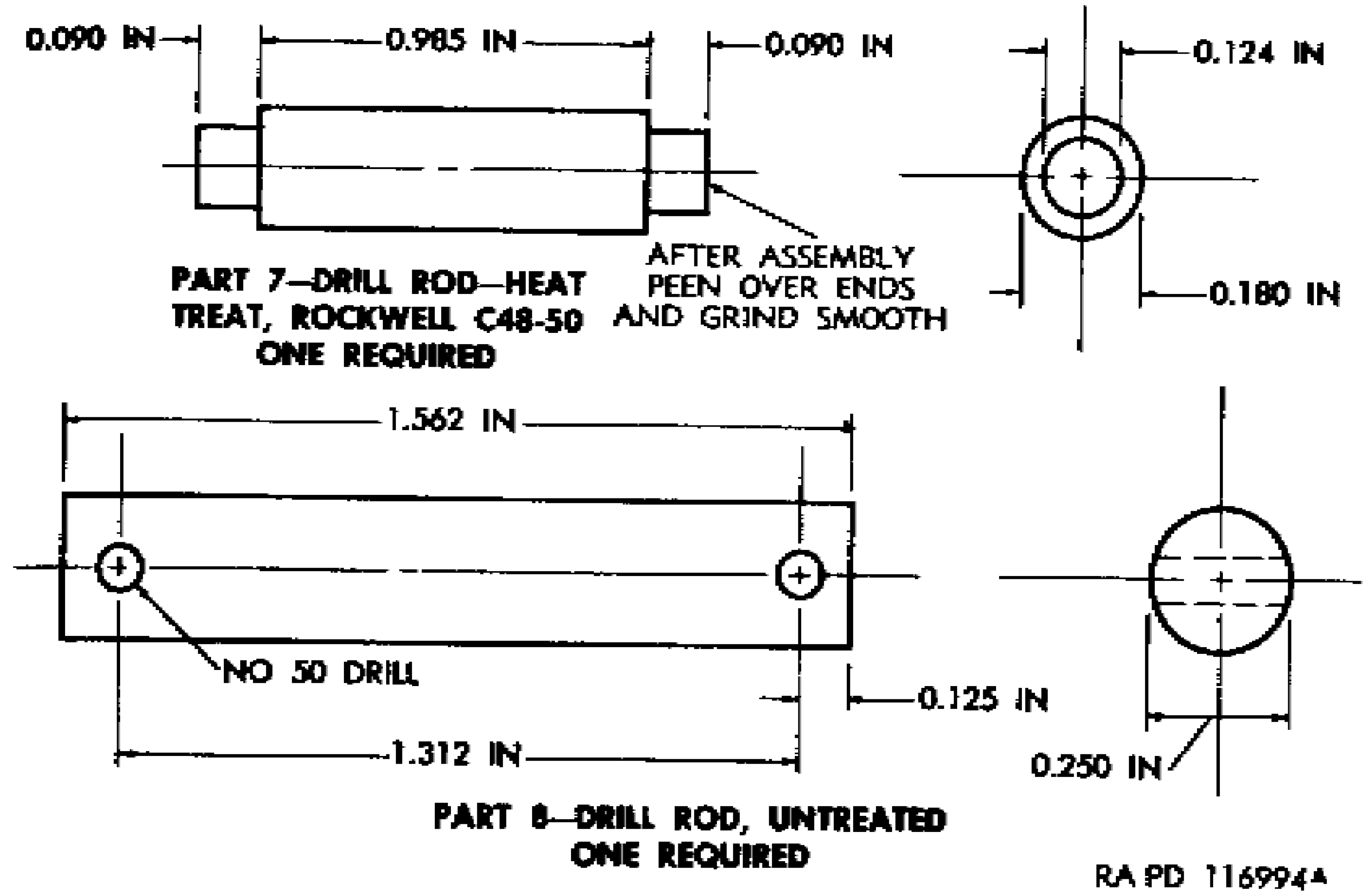


Figure 23. Detail of vise-held stamping fixture—part numbers 7 and 8.

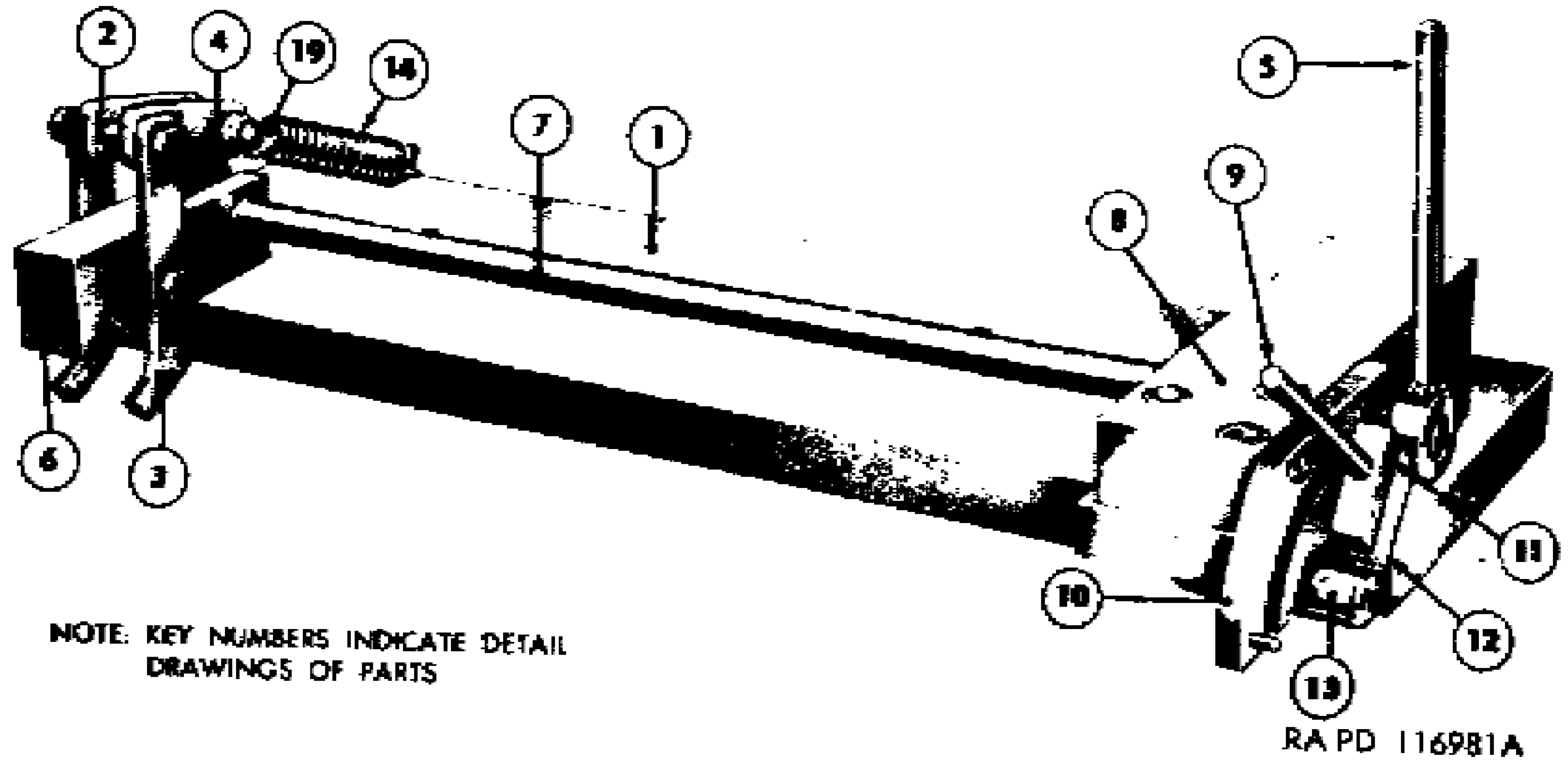


Figure 24. Bench-mounted stamping fixture.

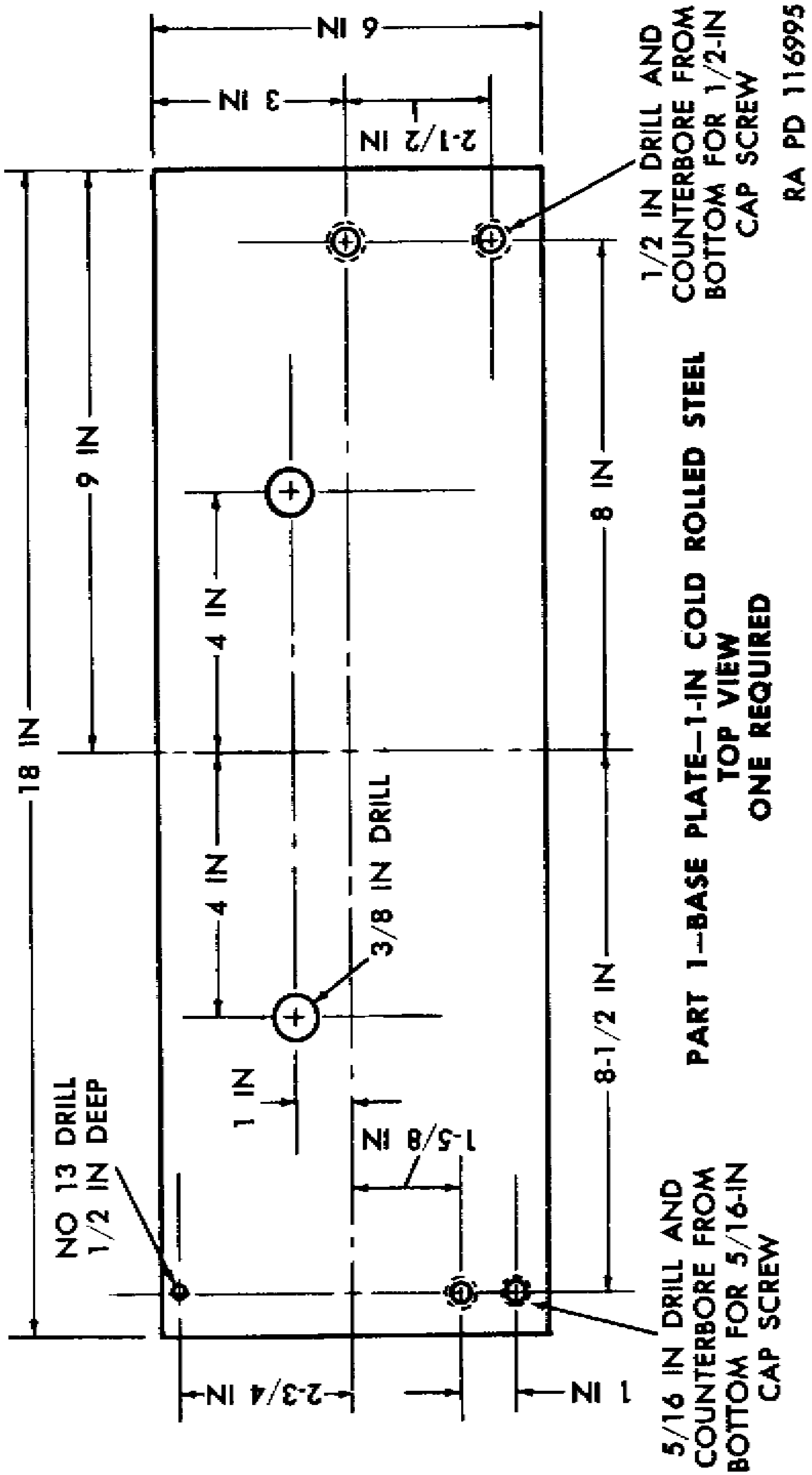


Figure 25. Detail of bench-mounted stamping fixture—part number 1.

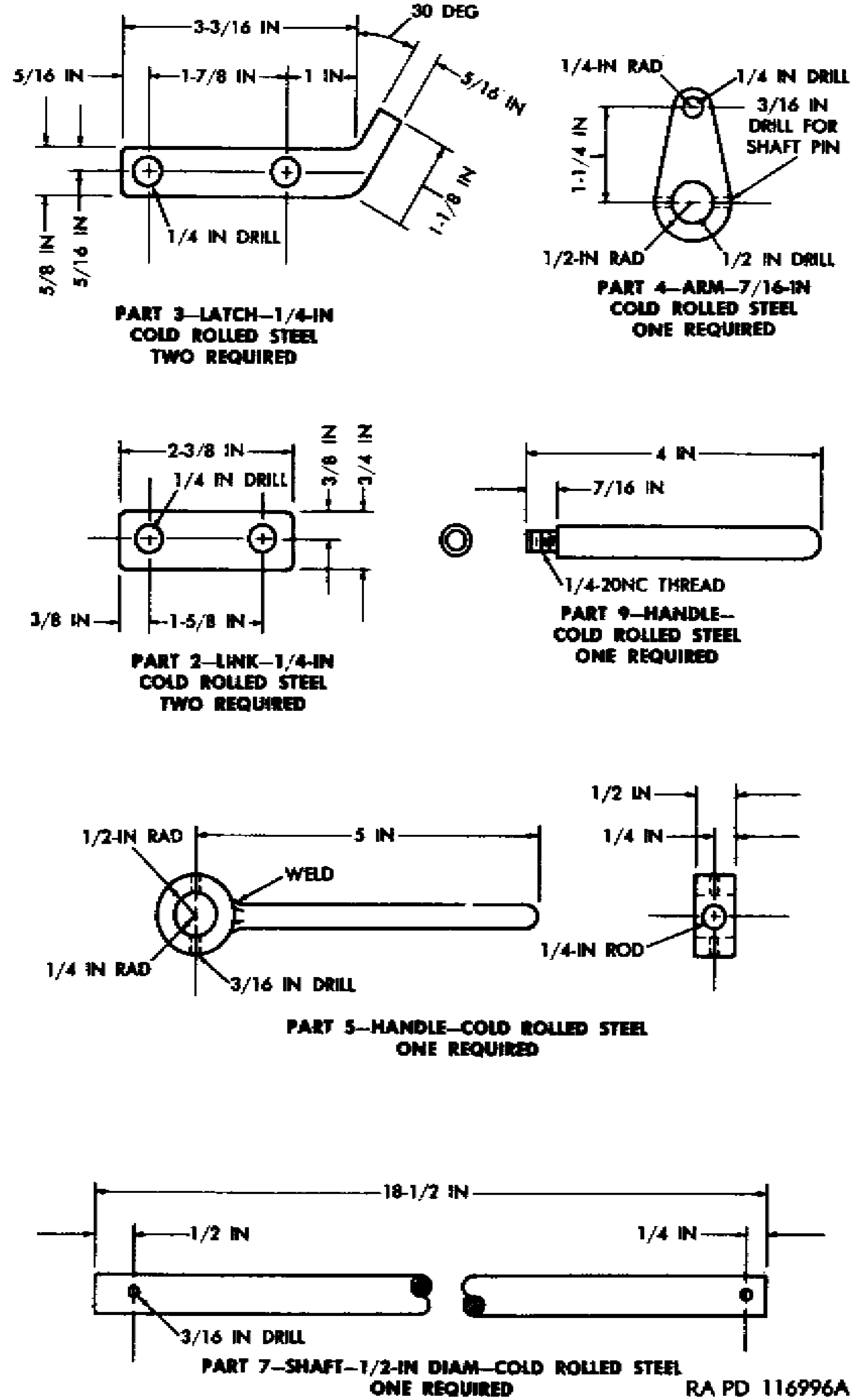


Figure 26. Detail of bench-mounted stamping fixture—part numbers 2, 3, 4, 5, 7, and 9.

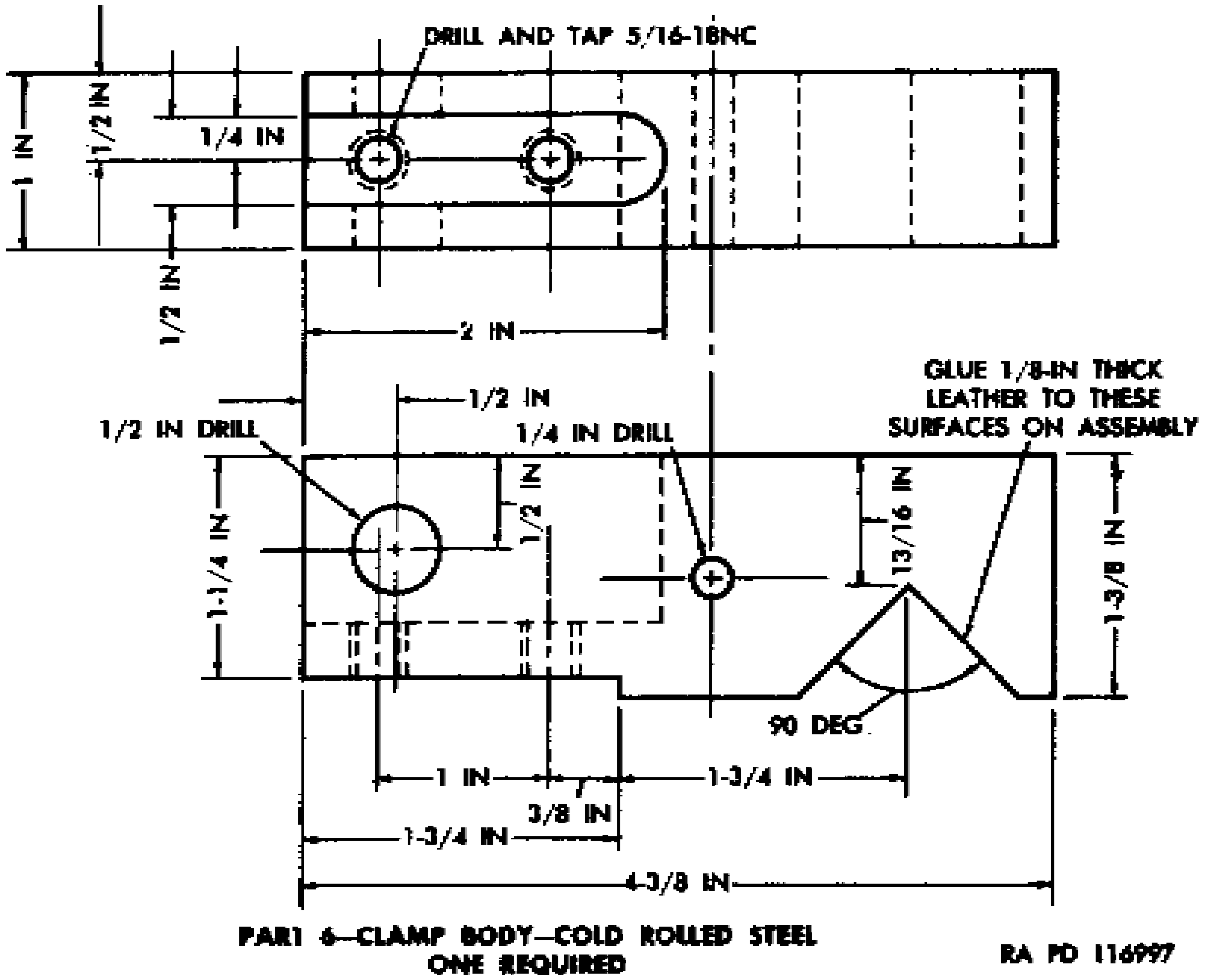


Figure 27. Detail of bench-mounted stamping fixture—part number 6.

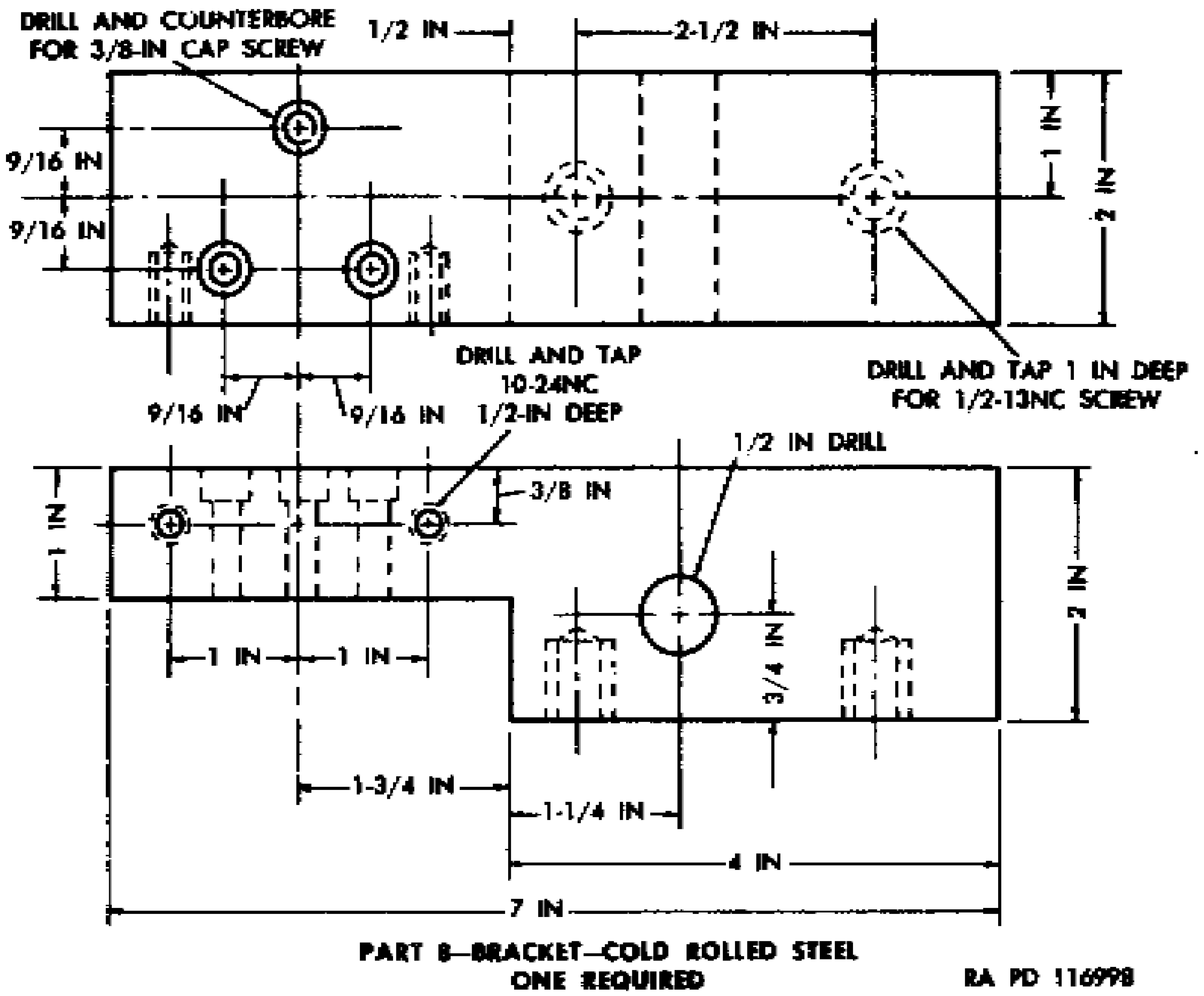


Figure 28. Detail of bench-mounted stamping fixture—part number 8.

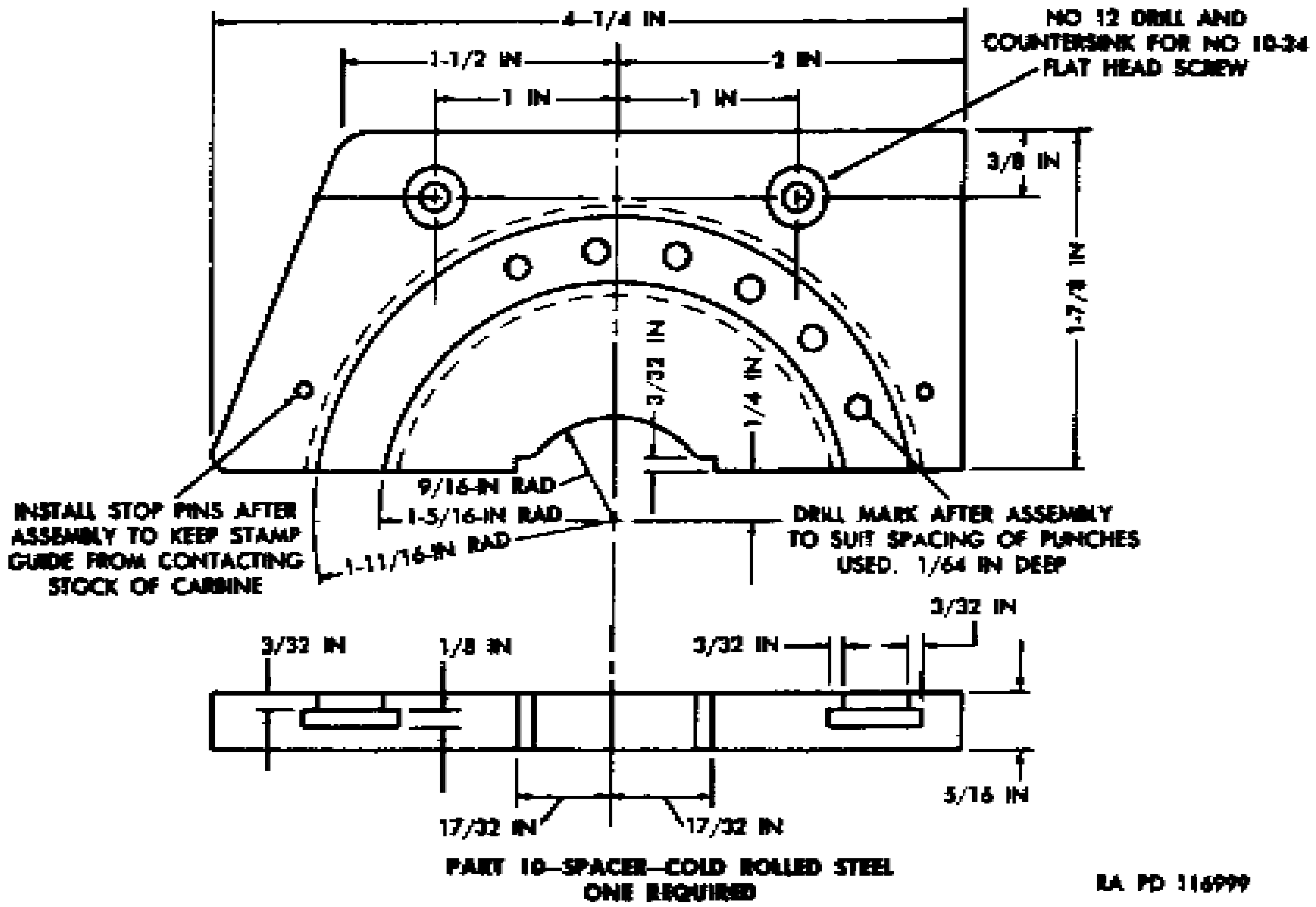


Figure 29. Detail of bench-mounted stamping fixture—part number 10.

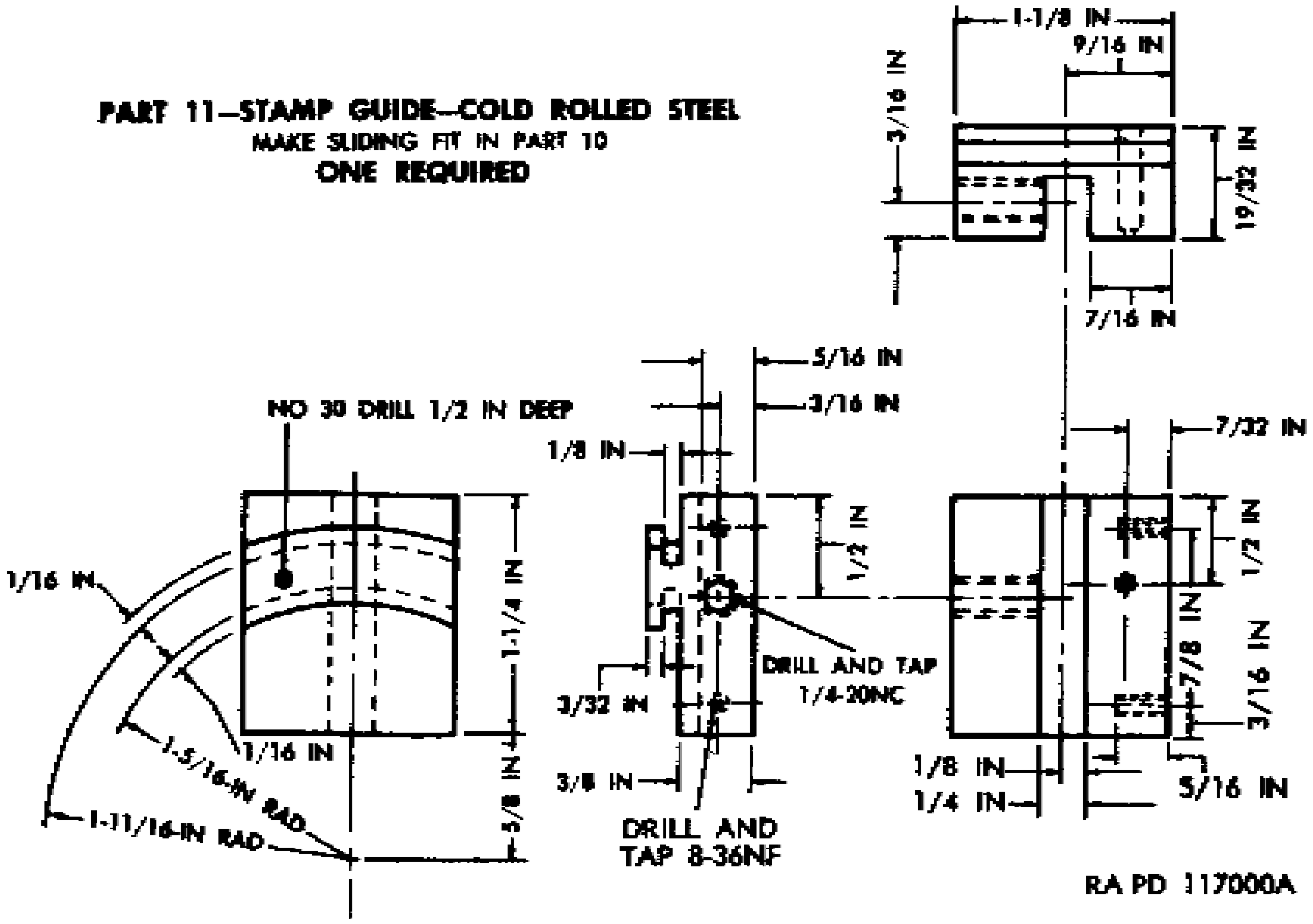


Figure 30. Detail of bench-mounted stamping fixture—part number 11.

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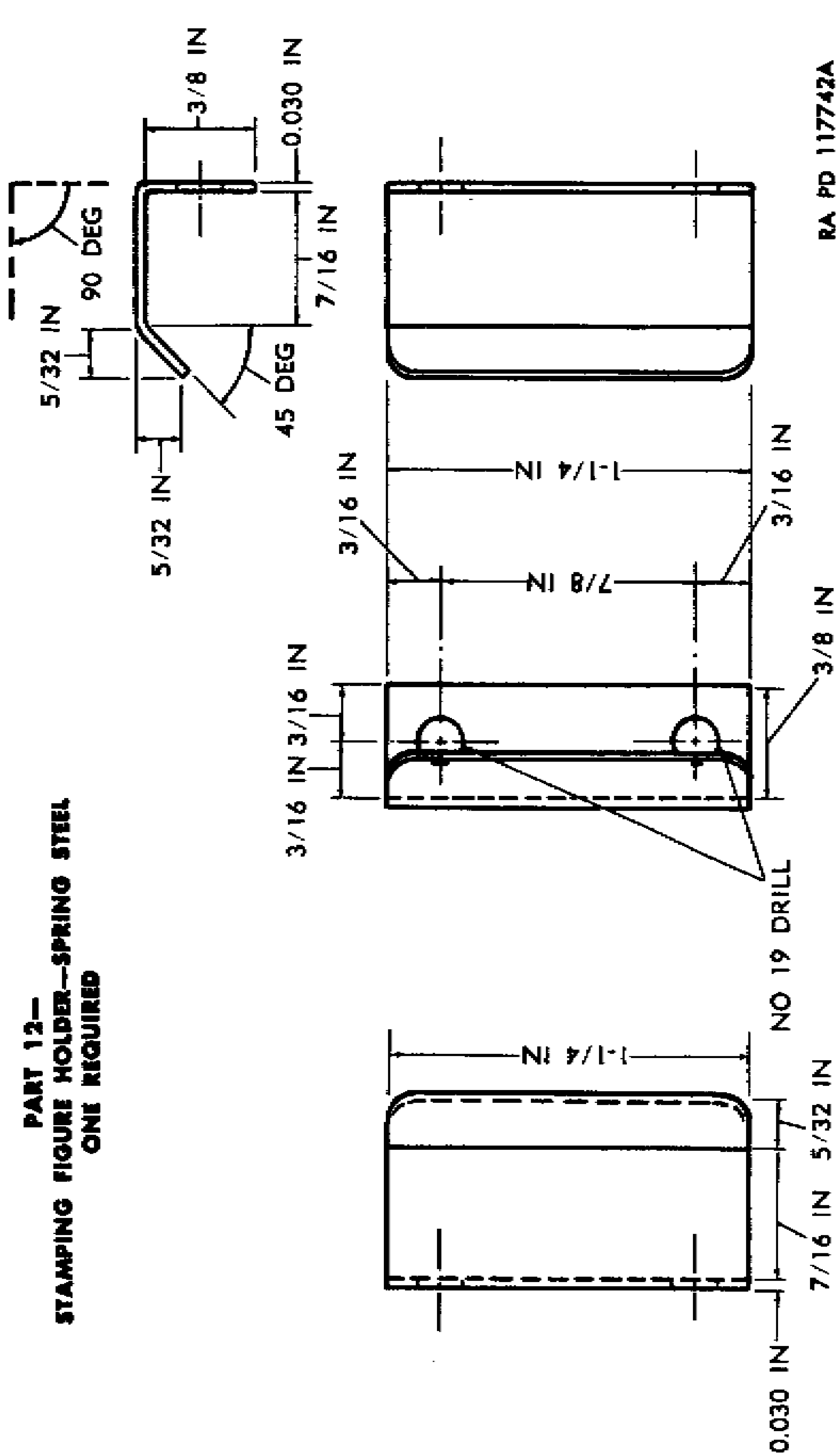


Figure 31. Detail of bench-mounted stamping fixture—part number 12.

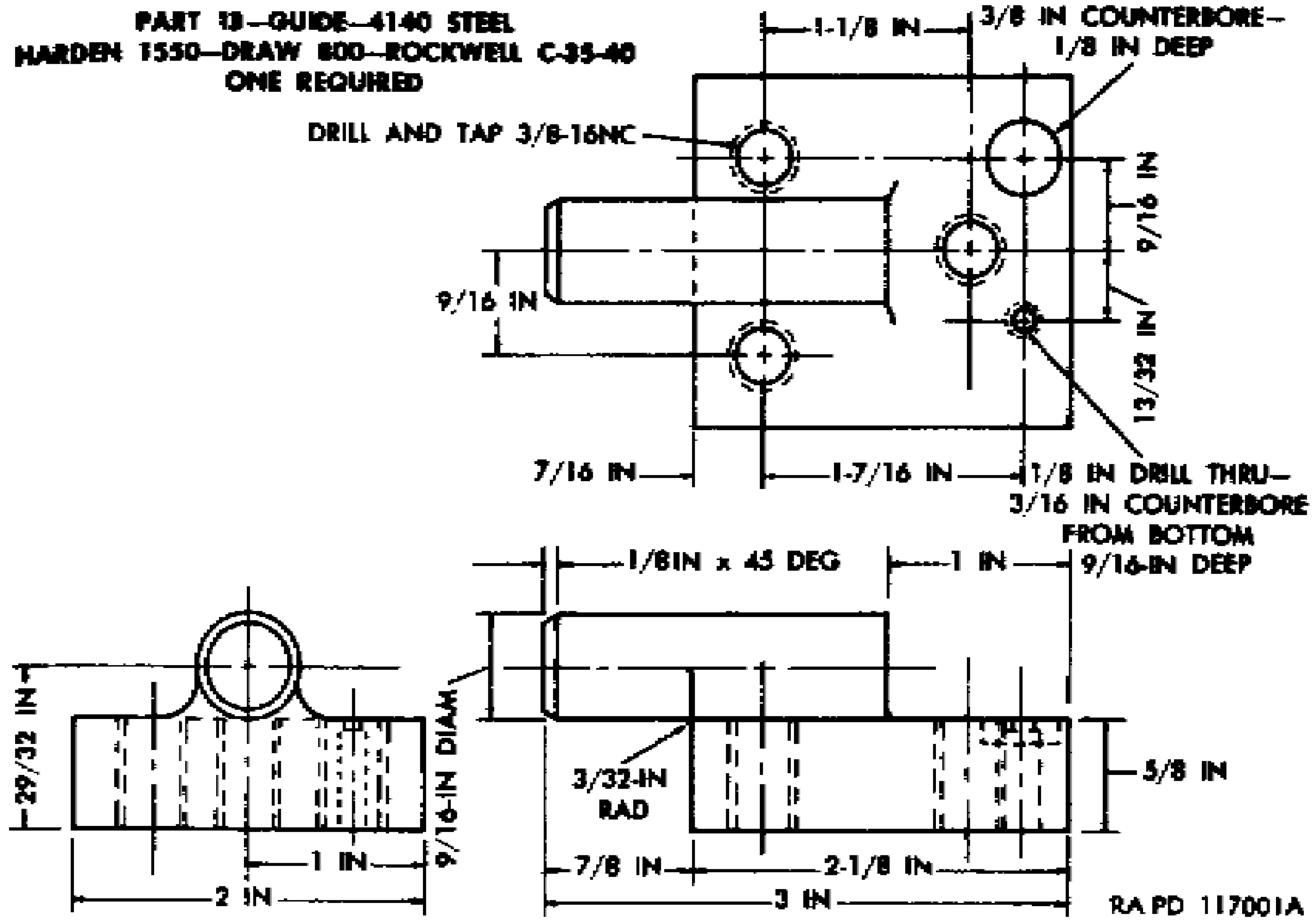


Figure 32. Detail of bench-mounted stamping fixture—part number 13.

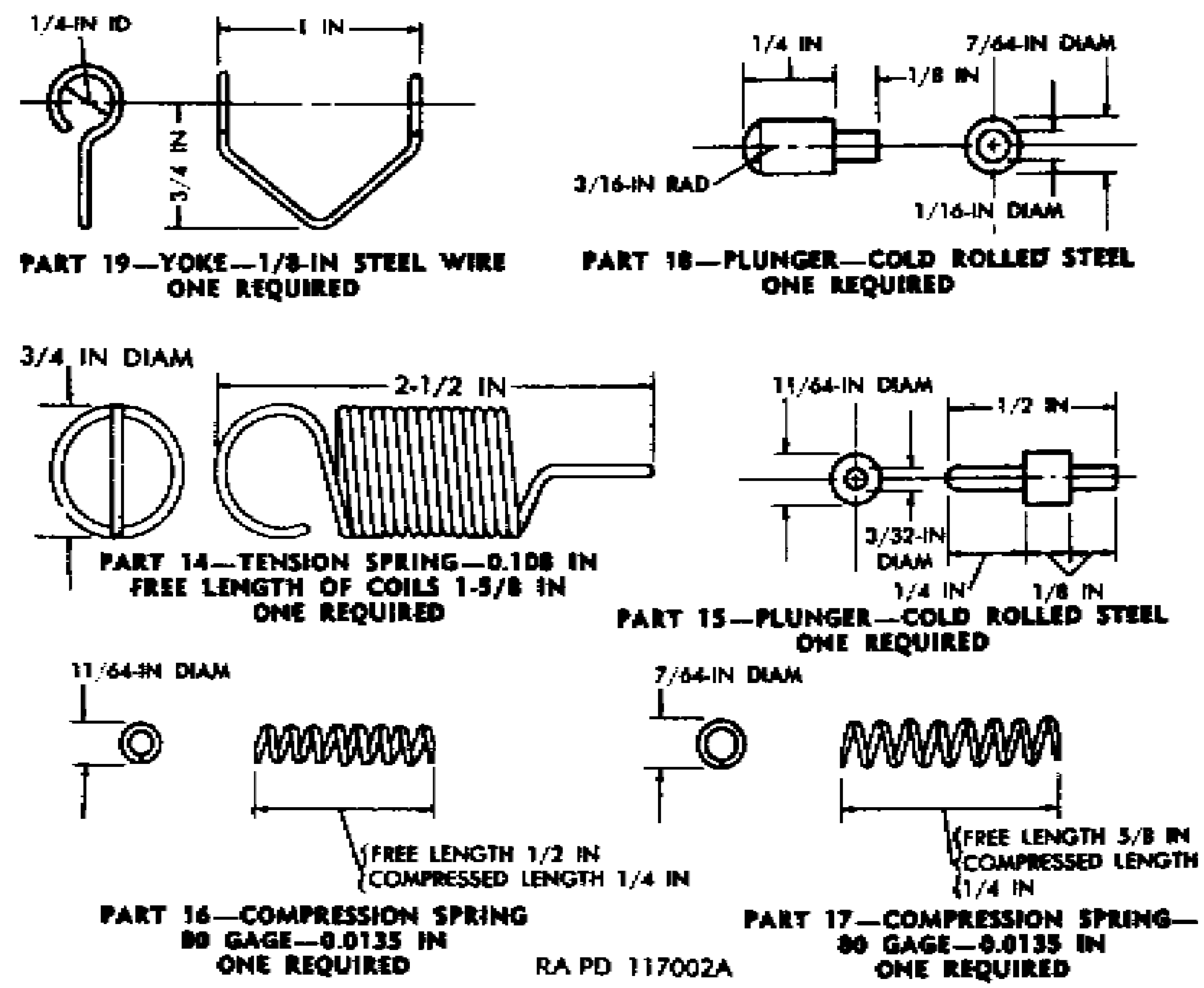


Figure 33. Detail of bench-mounted stamping fixture—part numbers 14, 15, 16, 17, 18, and 19.

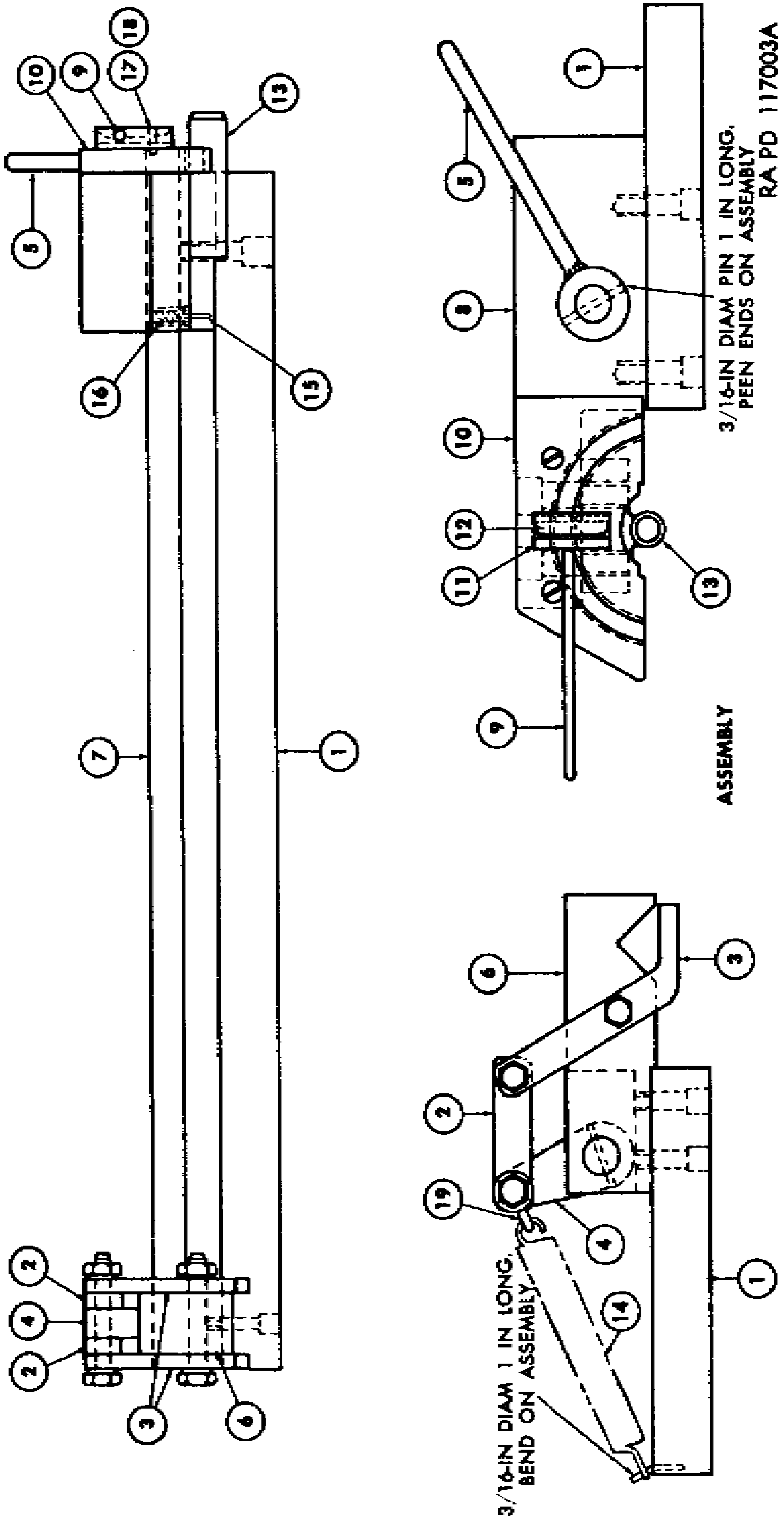


Figure 34. Detail of bench-mounted stamping fixture—assembly views.

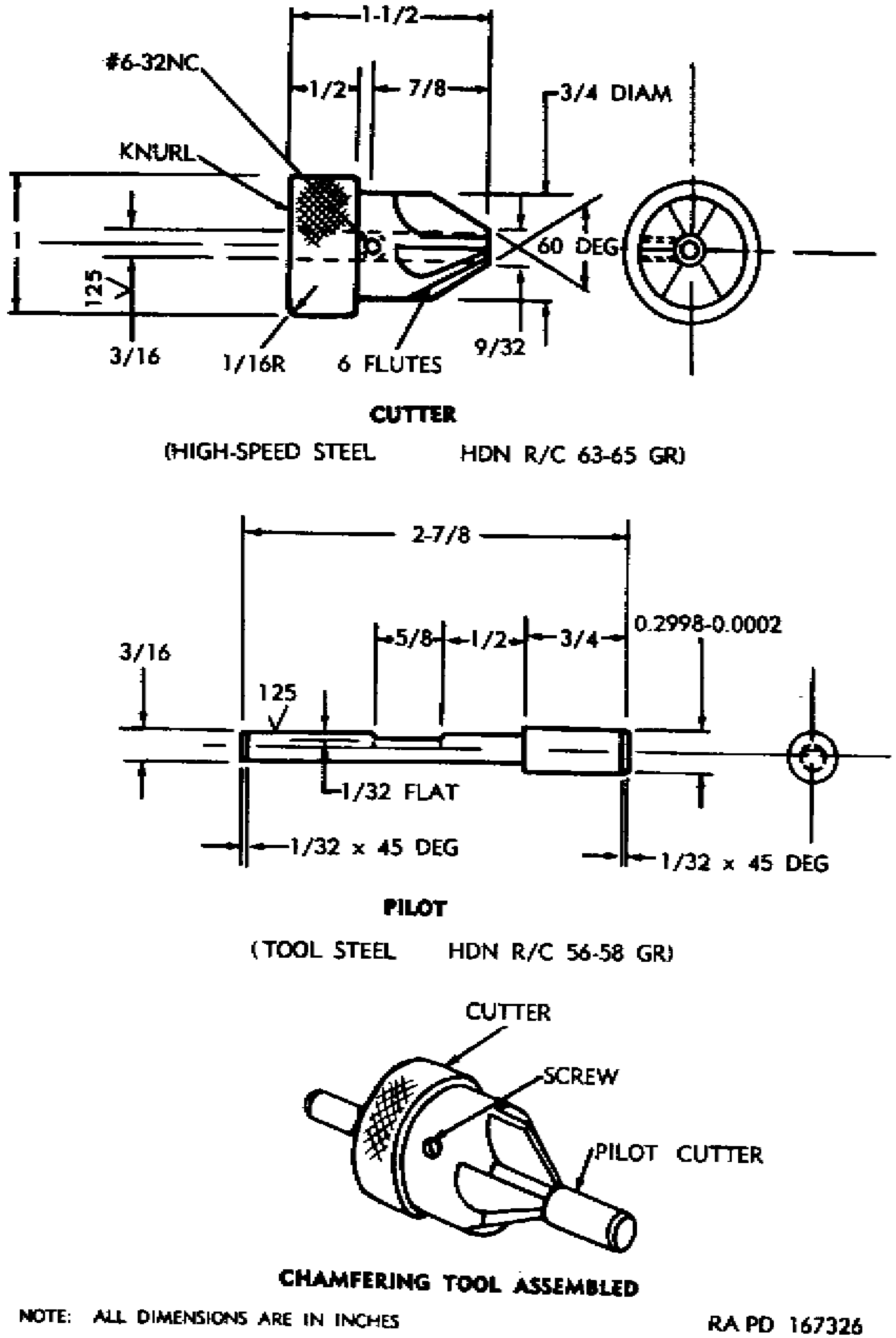


Figure 35. Detail of chamfering tool for counterboring muzzle.

CHAPTER 3

INSPECTION

Section I. GENERAL

11. Scope

This chapter provides specific instructions for the technical inspection by ordnance maintenance personnel of matériel either in the hands of troops or when received for repair in ordnance shops. It also briefly describes the in-process inspection of matériel during repair or rebuild and the final inspection after repair or rebuild has been completed. Trouble shooting information is incorporated wherever applicable as a normal phase of inspection.

12. Purposes of Inspections

Inspections are made for the purposes of (1) determination of the condition of an item as to serviceability, (2) determination of incipient failure, (3) the assurance of proper application of maintenance policies at prescribed levels, and (4) the ability of a unit to accomplish its maintenance and supply missions.

13. Categories of Technical Inspection

In general, five categories of inspection are performed by ordnance maintenance personnel.

a. Over-all Inspection. This is a periodic over-all inspection performed by a contact party on matériel in the hands of troops and an inspection performed by maintenance company personnel when matériel is evacuated to the ordnance company. The inspection of matériel evacuated is more thorough and includes check and repair of minor points that would not be required in the inspection performed by a contact party.

b. Pre-embarkation Inspection. This inspection is conducted on matériel in alerted units scheduled for oversea duty to insure that such matériel will not become unserviceable or worn out in a relatively short time. It prescribes a higher percentage of remaining usable life in serviceable matériel to meet a specific need beyond minimum serviceability.

c. In-process Inspections. These are inspections performed in the process of repairing (field maintenance) or rebuilding (depot maintenance) the matériel as prescribed in chapter 4. This is to insure that all parts conform to the prescribed standards, that the workmanship is in accordance with approved methods and procedures, and that deficiencies not disclosed by the preliminary inspection are found and corrected. Detailed instructions are contained in chapter 4. A tabulated listing of these same repair, overhaul, and rebuild standards is also provided in chapter 6 for ready reference.

d. Final Inspection. This is an acceptance inspection performed by a final inspector, after repair or rebuild has been completed, to insure that the matériel is acceptable for return to user or for return to stock according to the standards established. Detailed instructions are contained in chapter 5.

e. Spot Check Inspection. This is a periodic over-all inspection performed on only a percentage of the matériel in each unit to determine the adequacy and effectiveness of organizational and field maintenance.

Section II. TECHNICAL INSPECTION

14. General

Warning: Before starting a technical inspection, be sure to clear the weapon. Do not touch the trigger until the weapon has been cleared. Inspect the chamber to insure that it is empty and check to see that no ammunition is in position to be introduced. Avoid having live ammunition in the vicinity of the work.

a. Preparatory Procedures.

(1) Check to see that the weapon has been cleaned of all corrosion-preventive compound, grease, excessive oil, dirt, or foreign matter which might interfere with proper functioning or obscure the true condition of the parts.

(2) Make an over-all inspection of the weapon for general appearance, condition, operation, and manual functioning. Use dummy cartridges.

b. Inspection Guide. Table III is provided as a check list to be used as a guide for the inspection of weapons in the hands of troops. The over-all inspection column lists the standards denoting minimum serviceability and next column lists the standards for pre-embarkation inspection.

Note. The additional columns are provided for comparative information only to show the standards which are desired when the weapon is repaired or rebuilt in ordnance field or depot shops.

Table III. Inspection Guide for Cal. 30 Carbines M1, M1A1, M2, and M3

Point to be inspected	Overall inspection	Pre-embarkation inspection	Final inspection, field maintenance	Final inspection, depot maintenance
BORE AND CHAMBER.	Pits in chamber a allowable if they are not large enough to cause extraction difficulties. Pits in the bore as wide as a land or groove and three-eighths inch, or less, in length are allowable. Tool marks or scratches are acceptable regardless of length. Tool marks will appear as lines running laterally in the grooves or may run spirally across top of lands. Definitely ringed bores or bores ringed sufficiently to bulge the outside surface of the barrel must be rejected. However, faint rings or shadowy depressions are acceptable. Lands must be sharp.			
FINISH	Some glare permissible.	Intact enough to prevent glare.	Intact enough to prevent glare.	Approximate new finish.
FIRING PIN PROTRUSION.	No check	No check	Inspect visually	Min 0.048. Max 0.065.
FRONT BAND	Apply MWO ORD B28–W5 if not accomplished.	Apply MWO ORD B28–W5 if not accomplished.	Apply MWO ORD B28–W5 if not accomplished.	Apply MWO ORD B28–W5 if not accomplished.
FRONT SIGHT	Securely assembled with no burrs or malformations.	Securely assembled with no burrs or malformations.	Securely assembled with no burrs or malformations.	Securely assembled with no burrs or malformations.
HAND GUARDS	Not damaged so as to affect strength. Some looseness when assembled is acceptable. Liner must be tight.	Checks and cracks not affecting strength are acceptable. Some looseness when assembled is acceptable. Liner must be tight.	Checks and cracks not affecting strength are acceptable. Some looseness when assembled is acceptable. Liner must be tight.	Seasoned checks and cracks which have been reinforced by pins are acceptable. Some looseness when assembled is acceptable. Liner must be tight.
HEADSPACE	Bolt must not close on headspace gage 7319943 (headspace lgh 1.302) but must close without forcing on headspace gage 7319934 (headspace lgh 1.290).	Bolt must not close on headspace gage 7319943 (headspace lgh 1.302) but must close without forcing on headspace gage 7319934 (headspace lgh 1.290).	Min 1.290. Max 1.302. Use gage 7319934 or 7319943.	*Rebarreled* Min 1.290. Max 1.295. Use gage 7319934 or 7319936. With field test bolt 7319932. *Not Rebarreled* Min 1.290. Max 1.298. Use gage 7319934 or 7319938.

15. Inspection of Matériel in the Hands of Troops

a. General. Refer to TM 9–1100 for responsibilities and fundamental duties of inspecting personnel, the necessary notice and preparations to be made, forms to be used, and general procedures and methods to be followed by inspectors. Matériel to be inspected includes organizational spare parts and equipment and the stocks of cleaning and preserving materials. In the course of this technical inspection the inspector will accomplish the following:

(1) Determine serviceability, i. e., the degree of serviceability, completeness, and readiness for immediate use, with special reference to safe and proper functioning of the matériel. If the matériel is found serviceable, it will be continued in service. In the event it is found unserviceable or incipient failures are disclosed, the deficiencies will be corrected on the spot or advice given as to corrective measures when applicable, or if necessary, the matériel will be tagged for delivery to and repair by ordnance maintenance personnel.

(2) Check for causes of mechanical and functional difficulties that troops may be experiencing and for apparent results of lack of knowledge, misinformation, neglect, improper handling and storage, security, or preservation.

(3) Check on application of all authorized modifications to see that no unauthorized alterations have been made or that no work beyond the authorized scope of the unit is being attempted. The following modification work orders are considered mandatory as of this printing; however, also check the index in SR 310–20–4 and the current modification work order files for any additional modification work orders promulgated subsequent to this printing.

MWO	Title
MWO ORD B28–W3	Replacement of leaf type rear sight with adjustable rear sight.
MWO ORD B28–W4	Replacement of magazine catch and plunger to provide increased holding.
MWO ORD B28–W5	Replacement of front band to provide for attachment of bayonet.
MWO ORD B28–W6	Replacement of sliding type safety with rotary type.
MWO ORD B28–W7	Replacement of disconnector plunger assembly to prevent its loss.

(4) Instruct the using personnel in proper preventive maintenance procedures where found inadequate.

(5) Check on completeness of the organizational maintenance allowances and procedures for obtaining replenishments.

(6) Check conditions of storage of general supplies and ammunition.

(7) Initiate a thorough report on matériel on "deadline," with reasons therefor, for further appropriate action.

(8) The inspector should report to the responsible officer any carelessness, negligence, unauthorized modifications, or tampering. This report should be accompanied by recommendations for correcting the unsatisfactory conditions.

b. Inspection for Appearance and General Condition.

(1) Inspect barrel and receiver group for looseness in stock, and hand guard for excessive looseness on stock. Hand guard may have slight movement backward and forward. However, there should be no possibility of its becoming disengaged from the front band or skirt on the receiver. Tight hand guards are likely to push band off when recoil is heavy, as when grenade launcher is used.

(2) Inspect front band for looseness and locking on carbine and inspect sling swivel for looseness on band. Band should be held firmly in place by shoulder of locking spring.

(3) Inspect stock and hand guard for cracks; deep scars; and bare, rough wood surface: check grip (M1A1) for looseness on stock and for cracks.

(4) Inspect front and rear sights for looseness.

(5) Inspect oiler for retention in stock and for new type neoprene gasket. Inspect sling for wear and security on carbine.

(6) Inspect metal parts for rust, corrosion, scoring, and cracks.

(7) Inspect magazine for retention in trigger housing, ease of withdrawal, undue looseness, dents, rust, and movement of follower.

(8) Inspect sling eyelet for looseness on lower hinge assembly (M1A1), and hinge for looseness on stock grip.

(9) Inspect stock extension (M1A1) for hinge action, and positive locking when extended and folded, and butt plate for rotation and spring action on bars.

(10) Inspect cheek rest plate and retaining plate (M1A1) for looseness on bars, and cheek rest plate cover for wrinkles, scoring, and dried out leather.

(11) Inspect barrel. See paragraph 57*b*.

(12) Check to see that serial numbers on the receivers of M1 and M1A1 carbines (fig. 87) have not been obscured by the installation of the adjustable rear sight 7160060 (stamped type).

c. Functional and Operational Inspection. The following are in addition to inspections covered in FM 23–7.

(1) *Complete locking of bolt and forward movement of operating slide.* The slide should continue to move forward about five-sixteenths of an inch after the bolt is fully

locked. The same free movement should take place at the start of the rearward movement of the slide, before rotation of the bolt begins.

(2) *Chambering of cartridge.* The bolt should chamber the cartridge smoothly when released. If bullet ramp on receiver or barrel is rough, or if magazine catch does not retain magazine allowing it to tip forward, the bullet may bind on ramp or be deflected upward during chambering and strike the top of the barrel causing a stoppage.

(3) *Engagement of sear when trigger is not released.* On carbines M1 and M1A1 and on carbines M2 and M3 in semiautomatic position, the sear should engage and hold the hammer when the trigger is held back and the slide operated rapidly. This can be tested for by the following procedure:

(*a*) Grasp carbine by grip of stock with left hand.

(*b*) With index finger of left hand, pull trigger all the way to the rear and hold it in that position.

(*c*) Grasp operating slide handle with the right hand and move bolt back and forth rapidly five or six times, allowing the operating slide to come to rest in its forward position.

(*d*) Release trigger completely and then pull it again. If the hammer does not fall, it has been jarred out of engagement with the sear and followed the bolt forward. If this is the case, the carbine may fire in an uncontrolled manner and the firing mechanism must be inspected for worn or faulty parts.

(4) *Uncontrolled fire.* It has been found that at times individual carbines M1 and M1A1 fire in an uncontrolled manner. The term "uncontrolled" means that more than one cartridge is chambered and fired when the trigger is actuated once. Since the carbines M1 and M1A1 are both semiautomatic weapons, only one round should be fired whether the trigger is held or released. This tendency can often be determined during firing by the following procedure:

(*a*) Hold trigger in rearmost position.

(*b*) Manually retract the operating slide and allow it to return to battery.

(*c*) Release trigger very slowly. If carbine tends to fire in an uncontrolled manner, the hammer will often fall when the sear is heard to snap. The shock of counterrecoil will sometimes jar hammer from sear and uncontrolled fire results.

(5) *Safety.* The safety should rotate without undue interference. It should block trigger when turned so that the tang is vertical and release trigger when tang is pointing to the rear. It should be positively retained in either position.

(6) *Operating slide stop.* The operating slide stop is for the purpose of "hanging" the slide and bolt in the retracted position. Test functioning of stop by retracting bolt with operating slide, spring, and guide assembled, and pressing stop into retaining notch in receiver. When "hung" slide is slightly retracted, the stop should be cammed out of retaining notch in receiver and lie flush with (or above) lower face of slide and be held in this position by the friction spring. If stop spring becomes broken, stop may catch in retaining notch when slide reciprocates. If nose of stop or edge of retaining notch becomes worn, or friction spring becomes weak or broken, stop is likely to slip and fail to hang bolt. If there is insufficient friction on stop, it may jar into the notch and "hang" the bolt when the carbine functions. If such is the case, replace stop, spring, or operating slide.

d. Magazine. Test magazine for retention in carbine. Inspect follower for smooth movement in tube under force of spring by depressing follower and allowing it to rise. If follower does not depress and rise smoothly to the top of tube under spring action, look for burrs, rust, and corrosion in tube, reversed follower, deformed, or burred tube or follower, and weak, broken or reversed spring. Apply pressure evenly on the follower when depressing in order not to "cock" or rotate it in the tube.

e. Rear Sight Assembly. See paragraph 53 for inspection of the rear sight assembly.

f. Barrel and Receiver Group. See paragraph 57 for inspection of the barrel and receiver group.

g. Head Space Gaging.

(1) The head space of a carbine is the distance between the shoulder of the chamber and the face of the bolt when the bolt is in locked position. If head space is insufficient, the bolt will not fully lock behind the cartridge without being forced. If head space is excessive, the cartridge will have too much play in the chamber when the bolt is locked behind it. Either condition is unsafe. As component parts of the carbine are manufactured to close tolerances and head space is carefully checked at manufacture, any variation causing excessive head space to develop is due to wear.

(2) Excessive head space, due to wear, may be caused by worn faces of bolt, worn locking lugs on bolt, or worn locking shoulders in the receiver.

(3) Before testing for head space, clean bore, chamber of barrel, and operating parts thoroughly, wipe dry, and inspect for

metal fouling or foreign matter. Operate the mechanism a few times to see that the bolt closes and locks smoothly on an empty chamber. Disengage the bolt from the operating slide.

(4) See table II for head space standards and paragraph 57*d* for procedure in checking head space

h. Trigger Pull.

(1) *General.* The testing of trigger pull of carbines requires the availability of hooks and weights, which combine to 4½ and 7 pounds. Test trigger pull for smoothness and for pressure exerted. Trigger pull should be clean, without creep, smooth in action; and the force exerted to release hammer should be more than 4½ pounds and less than 7 pounds. If pull is rough, or not within specified limits, or creep is present, it indicates that there is wear or burrs on sear nose, hammer notch, or top of trigger lip, or interference between trigger and housing.

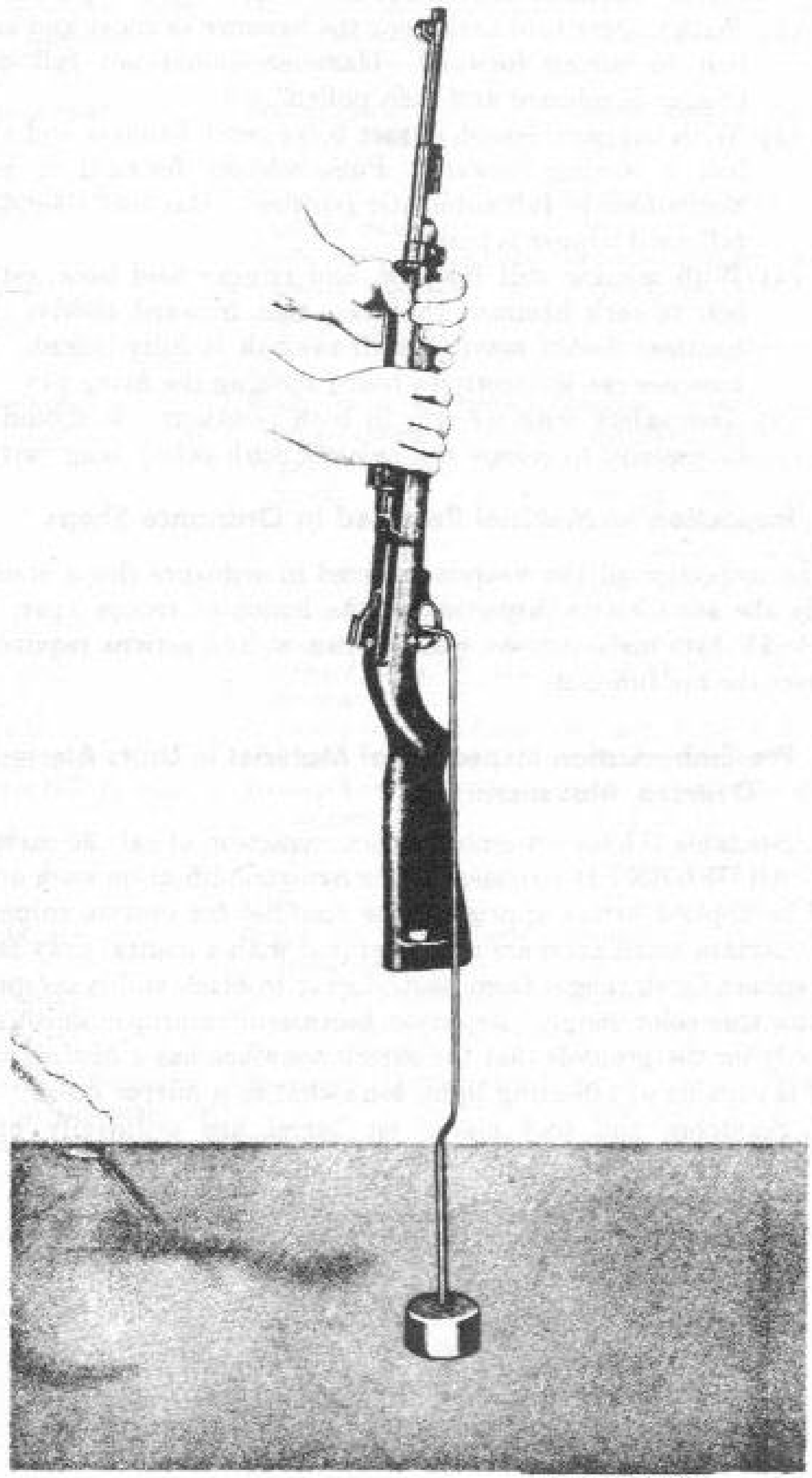
Note. The word "creep" is interpreted to mean any perceptible movement in the trigger pull between the time the slack is taken up and the hammer is released, with pressure applied to the trigger at a uniform rate of increase over a period of 10 seconds or more.

(2) *Testing trigger pull* (fig. 36). Note that safety is disengaged (its tang is point to rear) and that carbine is cocked. Have the weights resting on the floor or ground and insert the hook of trigger weight wire through the trigger housing guard bow to bear on the trigger so that pressure is applied one-quarter inch from lower end or tip of trigger. With the barrel of the carbine held vertically, raise the weight from the floor as gently as possible. If 4½-pound weight pulls the trigger to release the hammer, or the 7-pound weight fails to pull the trigger to release the hammer, correction is required. The only correction allowed in field repair is the selective assembly of hammer, hammer spring, sear, and/or trigger or all four until the required pull is obtained. Take care during the test to see that the wire contacts the trigger only and does not rub against the trigger housing or stock, and that wire and axis of bore are perpendicular to the floor.

Note. Each time weights are applied to the trigger, cock the weapon again, otherwise sear may be partially disengaged from hammer. This will result in a false reading next time weights are applied.

i. Inspection of Functions Peculiar to Carbines M2 and M3. With carbine fully assembled, unloaded, and safety turned to fire position, test functioning as follows:

(1) Pull selector fully to rear to place mechanism in the semiautomatic position. Then, with trigger released, fully re-



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Figure 36. Testing trigger pull.

tract bolt to cock the hammer and allow bolt to spring forward. Hammer should not fall until trigger is pulled.

(2) With trigger held back, cock the hammer as above and allow bolt to spring forward. Hammer should not fall until trigger is released and then pulled.

(3) With trigger released, retract bolt to cock hammer and allow bolt to spring forward. Push selector forward to place mechanism in full automatic position. Hammer should not fall until trigger is pulled.

(4) With selector still forward, and trigger held back, retract bolt to cock hammer, then ease bolt forward slowly. The hammer should not fall until the bolt is fully locked. The hammer can distinctly be heard striking the firing pin.

(5) Test safety with selector in both positions. It should not be possible to release the hammer with safety tang vertical.

16. Inspection of Matériel Received in Ordnance Shops

The inspection of the weapon received in ordnance shops is essentially the same as its inspection in the hands of troops (par. 15). Table IV lists malfunctions, possible causes, and actions required to correct the malfunction.

17. Pre-Embarkation Inspection of Matériel in Units Alerted for Oversea Movement

a. See table III for pre-embarkation inspection of cal. .30 carbines.

b. All URGENT Department of the Army modification work orders will be applied before approving the matériel for oversea shipment.

c. Certain small arms are manufactured with a neutral gray finish. Phosphate finish ranges from neutral gray to black and is acceptable within this color range. Rejection because of improper finish must be only on the grounds that the exterior surface has a distinct shine and is capable of reflecting light, somewhat as a mirror does.

d. Scratches and tool marks on barrel are ordinarily of no importance.

Table IV. Trouble Shooting

Malfunction	Probable causes	Corrective action
Failure to eject	Broken ejector	Replace ejector (par. 45).
	Weak or broken ejector spring.	Replace spring (par. 45).
Failure to extract	Damaged or broken extractor claw.	Replace extractor (par. 45).
	Broken or missing extractor plunger or spring.	Replace plunger and/or spring (par. 45).
	Large pits in firing chamber.	Replace barrel (par. 59).
Trigger hang	Weak, bent, or broken trigger spring.	Replace trigger spring (par. 31).
	Trigger spring disengaged.	Check seating of spring in seating notch in trigger and position of spring in housing aperture (par. 29).
	Old type trigger with 4- or 8-degree angle on forward face of the pedestal.	Replace with trigger of new design (par. 30*d*, FM 23-7).
Failure to fire	Defective or broken firing pin.	Replace firing pin (par. 45).
Hammer fails to cock	Damaged sear or broken sear spring.	Replace sear and/or spring (FM 23-7).
	Failure of bolt to move far enough to rear (par. 30*b*).	Check guideways in receiver for obstruction to movement (par. 57*a*).
Light trigger pull	Weak or broken sear spring (par. 30*c*).	Replace sear spring (FM 23-7).
Safety sticks	Missing or broken safety plunger and/or spring.	Replace safety plunger and/or spring (FM 23-7).
	Damaged safety	Replace safety (FM 23-7).
Operating slide does not operate smoothly or does not "hang."	Broken stop and/or spring.	Replace stop and/or spring (FM 23-7)
	Misalinement of barrel in receiver.	Check parallelism of barrel and receiver and correct (par. 59).
Obscured serial number	Installation of rear sight 7160060 on receivers of carbines M1 and M1A1. Also M2 carbines converted from M1 carbines.	Restamp serial number (par. 58*e*).

CHAPTER 4

REPAIR AND REBUILD

Section I. GENERAL

18. General

a. Information and instructions contained herein are supplementary to instructions for the using organization contained in FM 23-7.

b. In this manual, the main groups of the weapon are disassembled, inspected, replaced or repaired, and assembled. For information on removal and installation of groups, see FM 23-7. A group is a number of parts or assemblies, or both, which either function together or are intimately related to each other and should be considered together (fig. 37).

c. A rebuild flow chart (fig. 44) and an operation route sheet (table V), which specify the various steps necessary in rebuilding the weapon, are contained in this chapter for the use of maintenance shops engaged in rebuild for return to stock.

d. Information for ordnance maintenance units engaged in repair for return to user and information for maintenance shops engaged in rebuild for return to stock are covered together, but wherever the operation is not authorized for the field level of maintenance, a note is added such as (DEPOT MAINTENANCE ONLY) to indicate the prescribed level of maintenance.

e. Where different standards or tolerances are prescribed for field and for depot levels, the desired standard for the particular level is similarly indicated in parentheses.

19. Cleaning and Lubrication

Degrease, clean, and oil all matériel received in ordnance shop. Keep a light film of oil on all parts undergoing rebuild operations to prevent rust from forming on surfaces. Processed matériel in the shop should be kept clean and oiled at all times to prevent rusting. Information and instructions pertaining to cleaning, preserving, sealing, and related materials, are contained in TM 9-850. For detailed instructions for care and cleaning of the carbine, see FM 23-7.

20. General Repair and Rebuild Methods

a. The foreman in charge of repair and rebuild will procure a complete set of special tools (ch. 2). The number of units to be

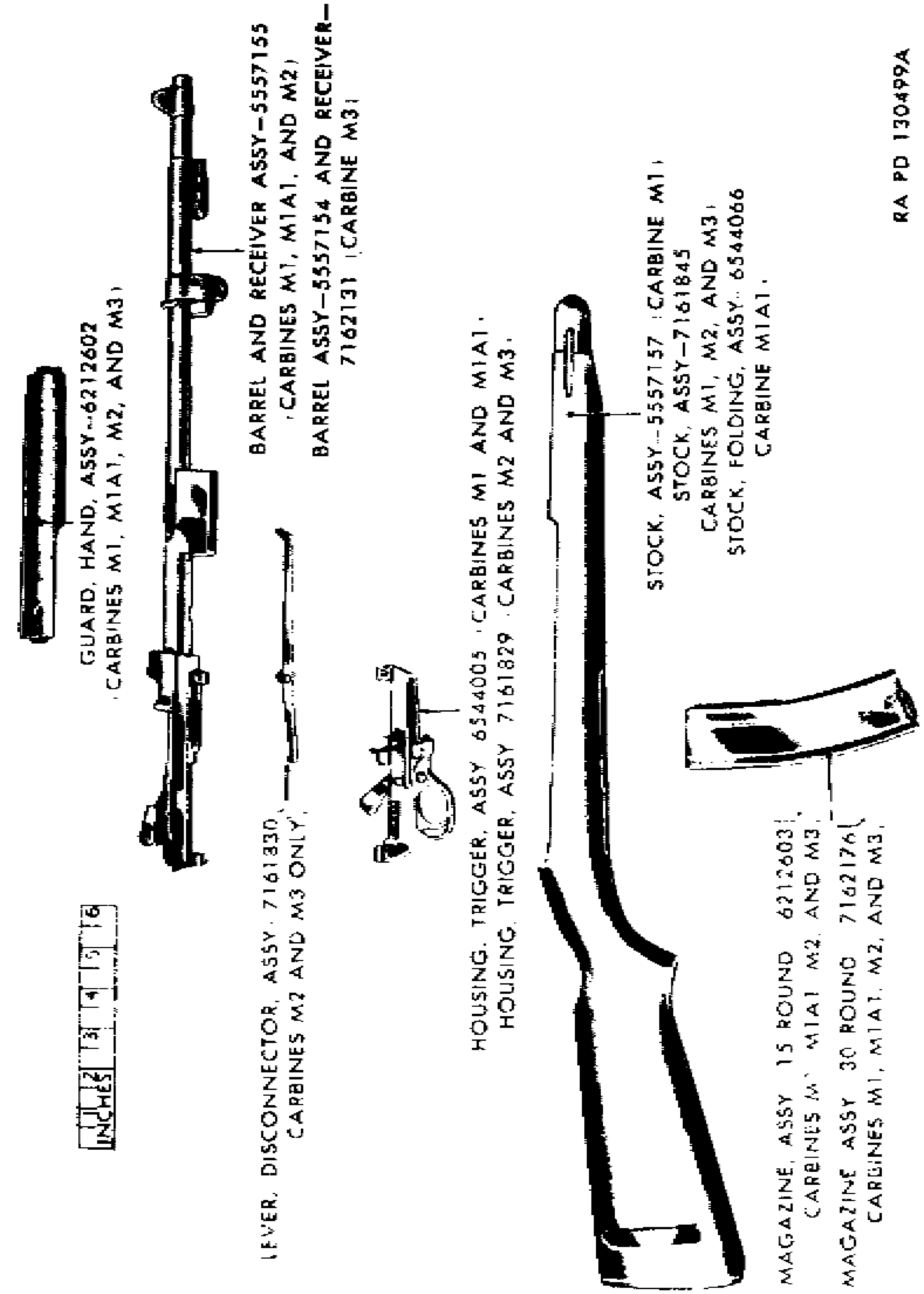


Figure 37. Assemblies comprising the weapon shown in relative positions.

processed will determine the disposition of manpower and job procedure, and the extent to which improvised tooling, assembly line methods, and special shop provisions are justifiable.

b. Precision tools for inspection of critical dimensions and tolerances will be provided where necessary.

c. Use only tools that fit snugly as loose fitting tools may damage part.

d. It is the responsibility of personnel engaged in disassembly to inspect parts as they are removed. Irreparable parts should be dropped from flow of parts as soon as possible.

e. Parts damaged to the extent that the cost of repair is greater than their replacement cost, should be discarded.

21. Removal of Rust and Fingerprint Deposit

a. Light rust may generally be removed with a cloth moistened with preservative lubricating oil or rifle-bore cleaner. If this does not suffice, use crocus cloth or fine abrasive cloth. Take care not to scratch or alter cleaned surfaces, to remove thoroughly all dirt and abrasive, and to reoil surfaces before assembling the parts.

b. For removal of deposits caused by the acid reaction of the fingerprint on the metal of unpainted machined surfaces, use fingerprint remover oil 14–C–789–25.

22. Removal of Burrs From Threads, Screw Heads, and Working and Wooden Surfaces

a. During the life of the carbine, polishing and stoning are necessary to relieve friction and to remove burrs set up by firing and usage. Remove burrs on screw heads, threads, and like surfaces with a fine file, or chase out with a corresponding sized die or tap. Remove burrs on working surfaces, such as bolt lugs, operating slide grooves, etc., with a fine grain sharpening stone. Smooth rounded contacting surfaces with crocus cloth.

Caution: Be careful to stone and file evenly and lightly and do not remove more metal than is absolutely necessary. Never alter parts or assemblies in any way that will affect interchangeability or proper operation or function. If parts are so damaged that critical dimensions would be changed by filing or stoning, replace with a part from stock.

b. On wooden components, dents or mutilations that do not affect strength or general appearance may be sanded out. Wood dough may be used if practicable. Unvarnished wooden components, such as stocks and hand guards, should be sanded all over and treated with linseed oil, mixed with an approved fungicide if inspection reveals presence of fungus. Patching is permitted where strength is not

affected. See paragraph 62*d* for repairs and patching of wooden components. Points that bind may be relieved by filing or paring using a fine file or sharp flat blade.

23. Replacement of Springs

All springs that are corroded, set, weak, distorted, or fail to meet standards are to be replaced. Refer to TB ORD 366 for coil spring standards.

24. Marking of Rebuilt Weapons

All carbines rebuilt must be stamped with the initials of the rebuilding establishment in the United States; weapons rebuilt by oversea depot shops are not to be stamped. Stamp the initials identifying the establishment rebuilding a carbine on the left side of the stock between the hand grip and the butt plate. If the weapon is subsequently rebuilt at another establishment, place the new identifying initials directly below those preceding. If the weapon is rebuilt at the same establishment as before, new initials need not be added. The establishments and the initials to be used are as follows:

Augusta Arsenal	AA
Benicia Arsenal	BA
Mt. Rainier Ordnance Depot	MR
Raritan Arsenal	RA
Red River Arsenal	RRA
Rock Island Arsenal	RIA
Springfield Armory	SA

25. Firing Tests

a. Function Firing. Following repair or complete rebuild, fire each M2 and M3 carbine 10 rounds full automatic and 10 rounds semiautomatic. Fire each M1 and M1A1 10 rounds semiautomatic. If carbines do not function satisfactorily, additional rounds are authorized. Function firing is required, in field maintenance, only when adequate facilities are available. Quality controlled function firing may be used provided the number of weapons to be function fired is sufficient to warrant.

	Fire consecutive rounds from each weapon of first 100 weapons	*After 100 weapons fire satisfactorily, fire consecutive rounds from each weapon as indicated*	
		Each 10th weapon	*Each intervening weapon*
M1 and M1A1	10 rounds semiauto.	10 rounds semiauto.	7 rounds semiauto.
M2 and M3	10 rounds auto.	10 rounds auto.	7 rounds auto.
M2 and M3	10 rounds semiauto.	10 rounds semiauto.	7 rounds semiauto.

b. Function Tests. Function tests should be shot from the shoulder or from a buck, spring loaded to simulate actual recoil conditions. A spring which allows the carbine to recoil approximately one-half inch is acceptable. If function tests indicate a lack of power, improvement may be secured through the use of the counterbored type piston nut 5196436 which permits longer travel of the piston. This nut differs from the plain type in that it has a counterbored piston seat in the forward end approximately 0.030 inch deep (fig. 38).

Warning: A semiautomatic or automatic weapon which functions satisfactorily in a test that allows no recoil, may not function at all when fired under field conditions because of insufficient power. It is important, therefore, that the function tests be conducted properly. This is particularly important in the case of carbines M2 and M3.

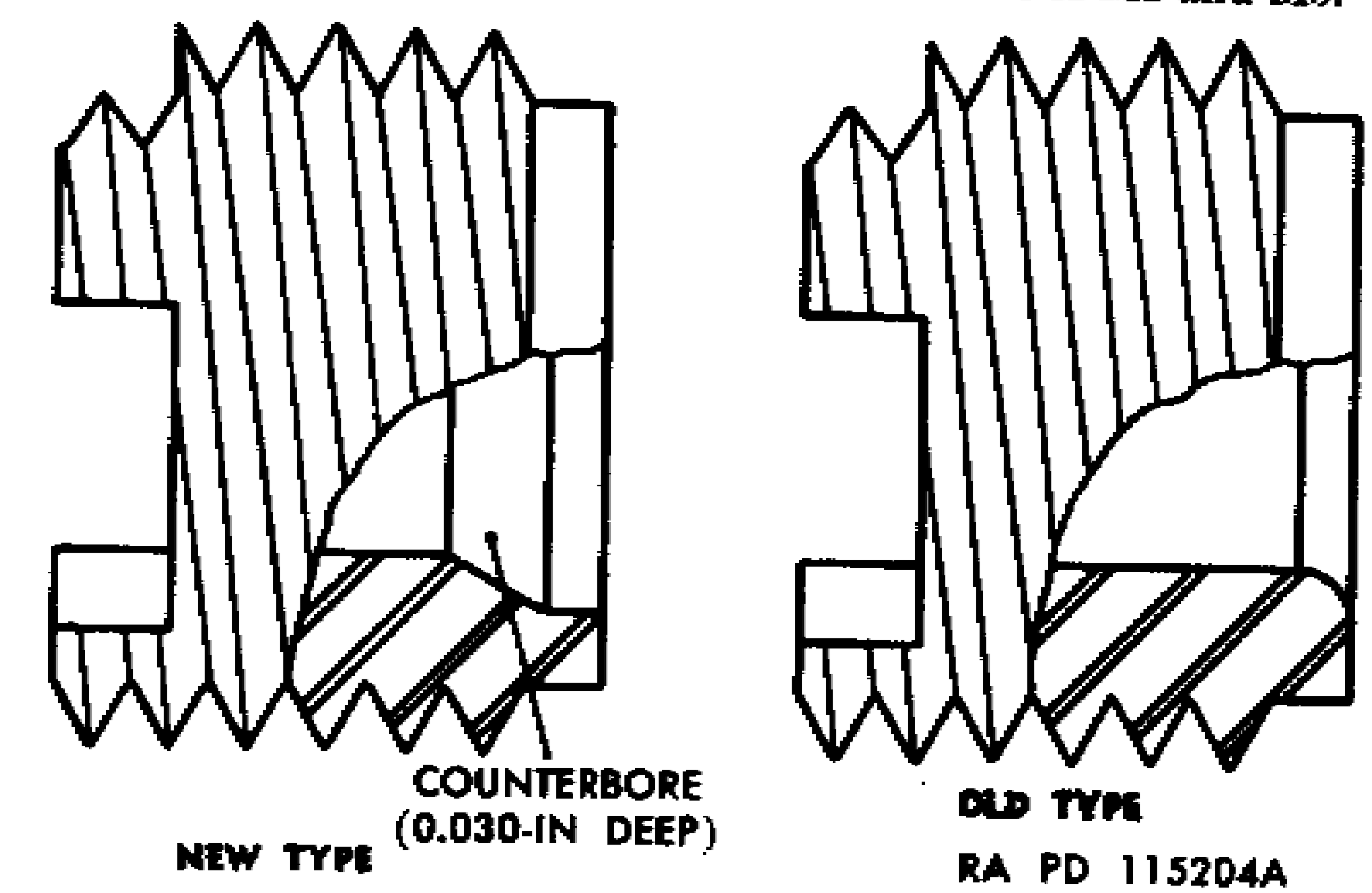


Figure 38. Piston nut 5196436.

c. Targeting (Depot Maintenance Only).

(1) Target each carbine as indicated on figures 39 and 40 and fire semiautomatically. Adjust each carbine to meet the following requirements as final inspection:

(*a*) With machined type sight, adjust windage knob and/or index plate so that zero line of index plate concides with zero line on rear sight base. With the stamped type sight, aline ramp with mark on index plate and center index plate. The ramp should then be within 0.012 inch (2 clicks) of the center of the base.

(*b*) Set the elevation at the 100-yard setting.

(*c*) Top of front sight blade shall be centered at "A" of targeting diagram for 25 yards.

(*d*) Five out of seven shots should fall within or cut the dotted line.

Note. It should be understood that in processing inspection (as distinguished from final inspection), the adjustment of windage is accomplished by moving the rear sight base in the receiver, as necessary, and the elevation is adjusted by the height of the front sight blade. In order that the above requirements be met, it is advisable to adjust the sights as closely as practicable to the place where the carbine is shooting. To do this, adjust position of rear sight in receiver and height of front sight blade.

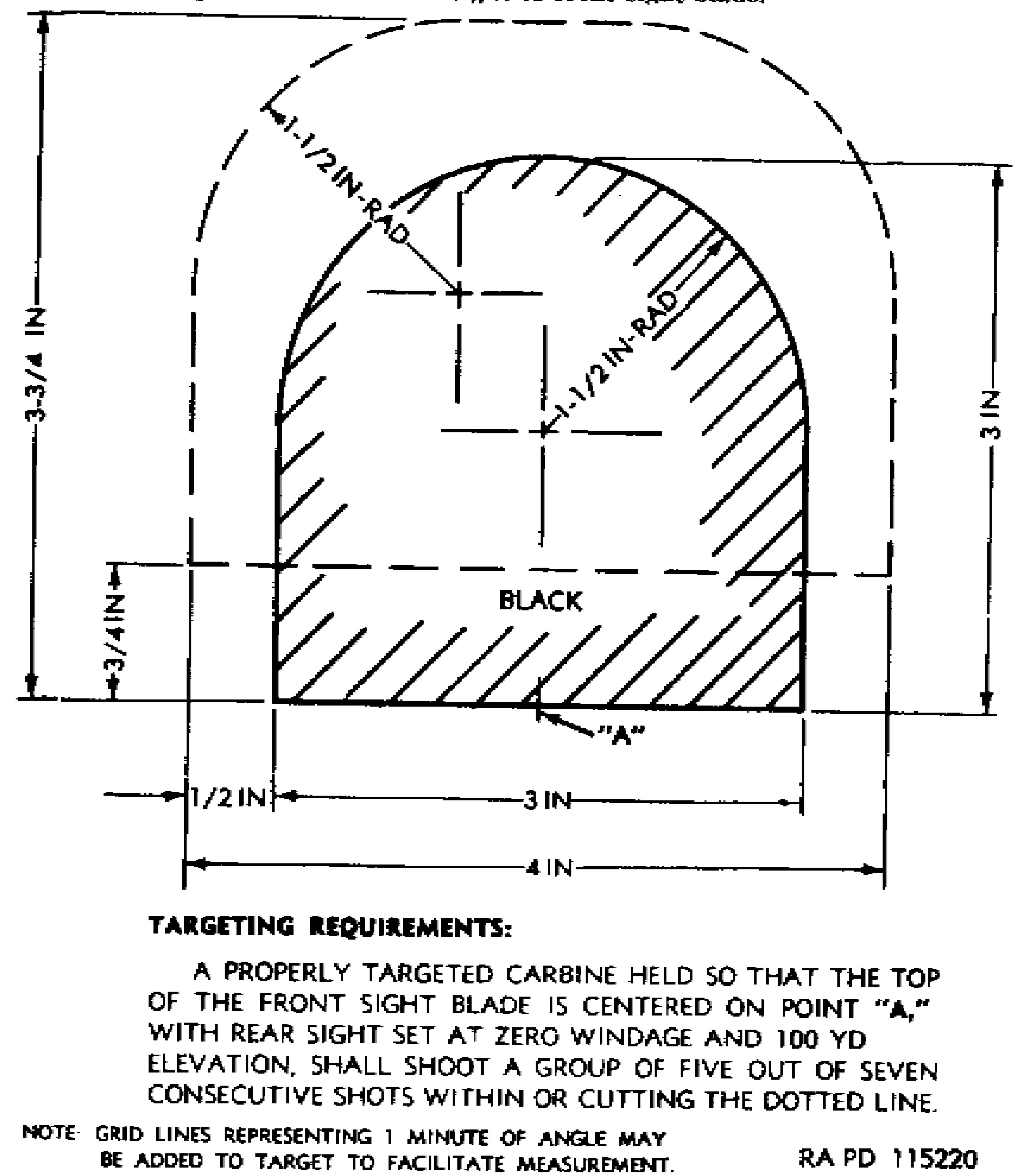
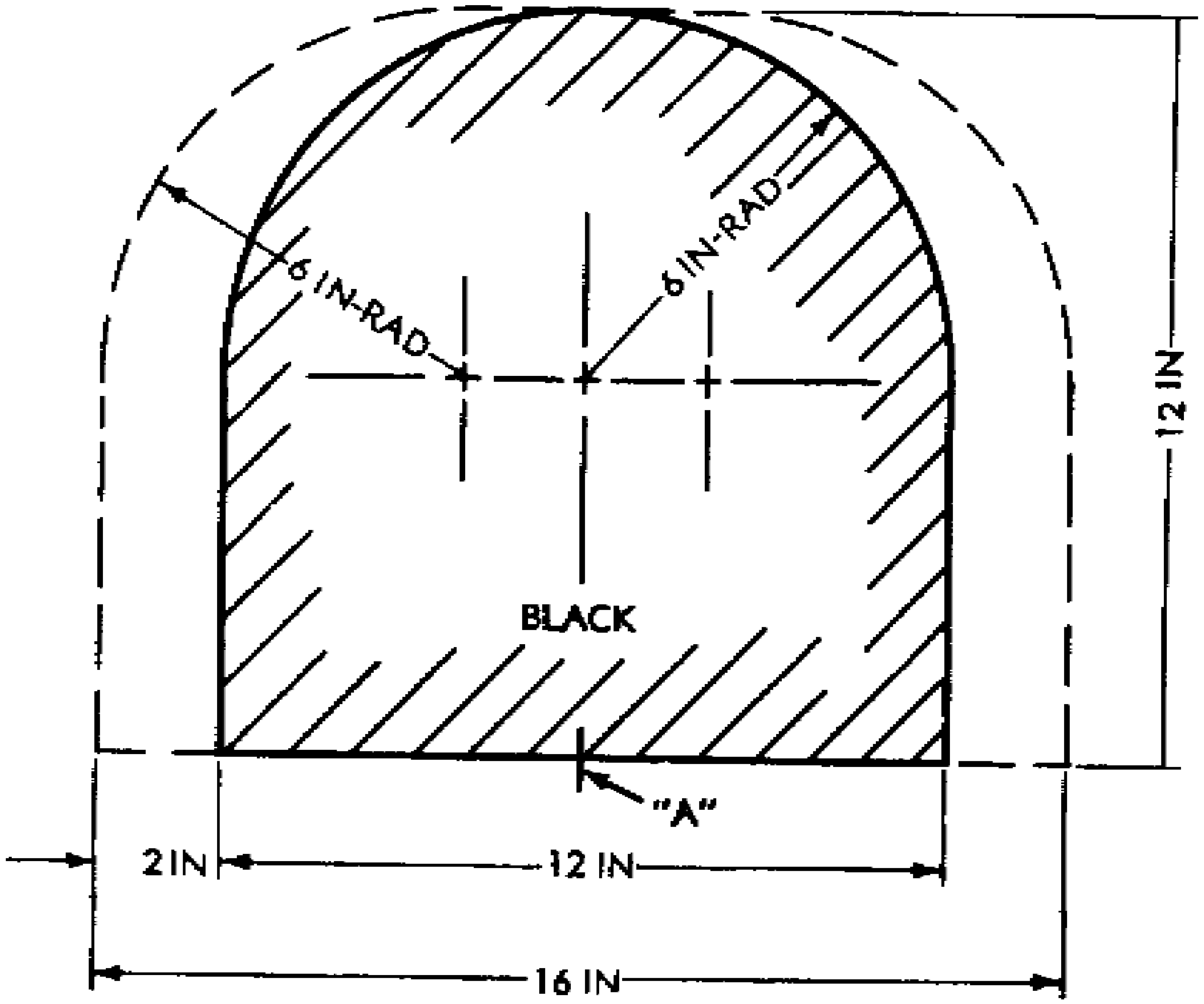


Figure 39. 25-yard range targeting diagram for carbines, cal. 30, M1, M1A1, and M2.

(2) In the event that suitable firing ranges are not available, the use of a bore sighting method, which has received prior approval of Chief of Ordnance, Washington 25, D. C., ATTENTION: ORDFM, is required. A satisfactory bore sighting scope and the proper method for using it is shown in figure 41. The assembly drawing which should be used



TARGETING REQUIREMENTS:

A PROPERLY TARGETED CARBINE HELD SO THAT THE TOP OF THE FRONT SIGHT BLADE IS CENTERED ON POINT "A," WITH REAR SIGHT SET AT ZERO WINDAGE AND 100 YD ELEVATION, SHALL SHOOT A GROUP OF FIVE OUT OF SEVEN CONSECUTIVE SHOTS WITHIN OR CUTTING THE DOTTED LINE.

NOTE: GRID LINES REPRESENTING 1 MINUTE OF ANGLE MAY BE ADDED TO TARGET TO FACILITATE MEASUREMENT.

RA PD 115221

Figure 40. 100-yard range targeting diagram for carbines, cal. .30 M1, M1A1, and M2.

in its manufacture is C7138422 (figs. 42 and 43). For local fabrication the following parts (or drawings) also are necessary:

Screw	540876
Pad	A32820
Prism	A36234
Objective	A36359
Holder	A37820
Wedge	A37821
Reticle	A37950 (Mod)
Shield	A39125
Diaphragm	A39410
Screw	A39411
Separator	A49894
Eyelens	A49895
Lens	A49896
Ring	A49898
Cell	B16515
Cell	B138015 (Mod)
Optical system	B7138643
Elbow	C44432 (Mod)

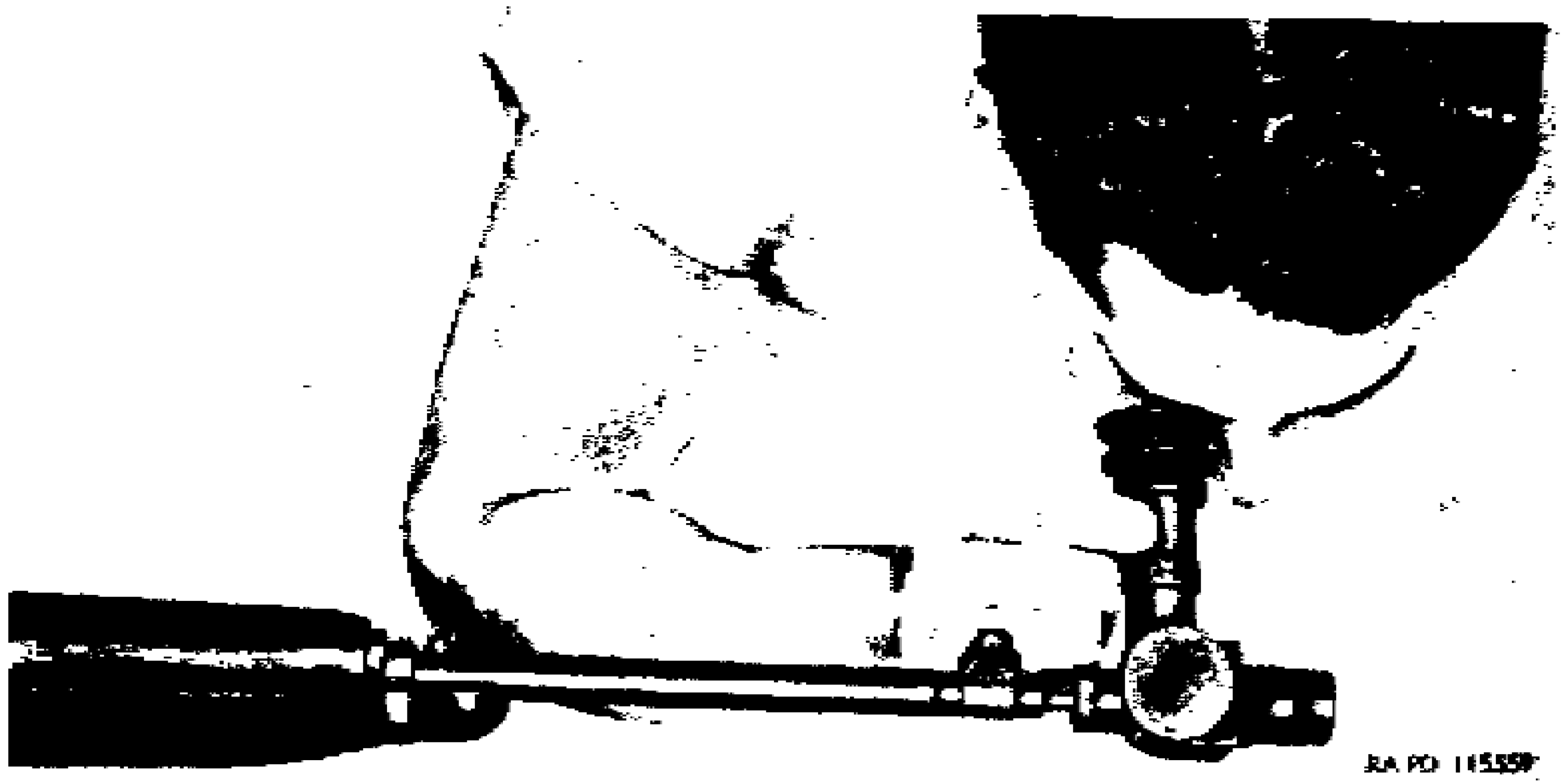


Figure 41. Method of using bore sighting scope.

d. Proof Firing (DEPOT MAINTENANCE ONLY). Each rebarreled carbine must be proof fired with one high pressure test round.

e. Cleaning After Test Firing.

(1) After all firing tests have been completed, clean all weapons as soon as possible after firing and each day thereafter for 3 days making a total of 4 consecutive days. An alternate method of scheduling cleaning operations is as follows: Clean all carbines immediately after function firing and at three successive times following the first cleaning. All cleanings should be separated by an interval of at least 16 hours with a time lapse of not more than 72 hours between any two successive cleanings.

(2) Special care should be taken to insure that bolt faces, pistons, breech end of the receivers, and other parts subjected to burnt powder residue are thoroughly cleaned. These parts should be scrubbed with a bristle brush moistened with rifle-bore cleaner.

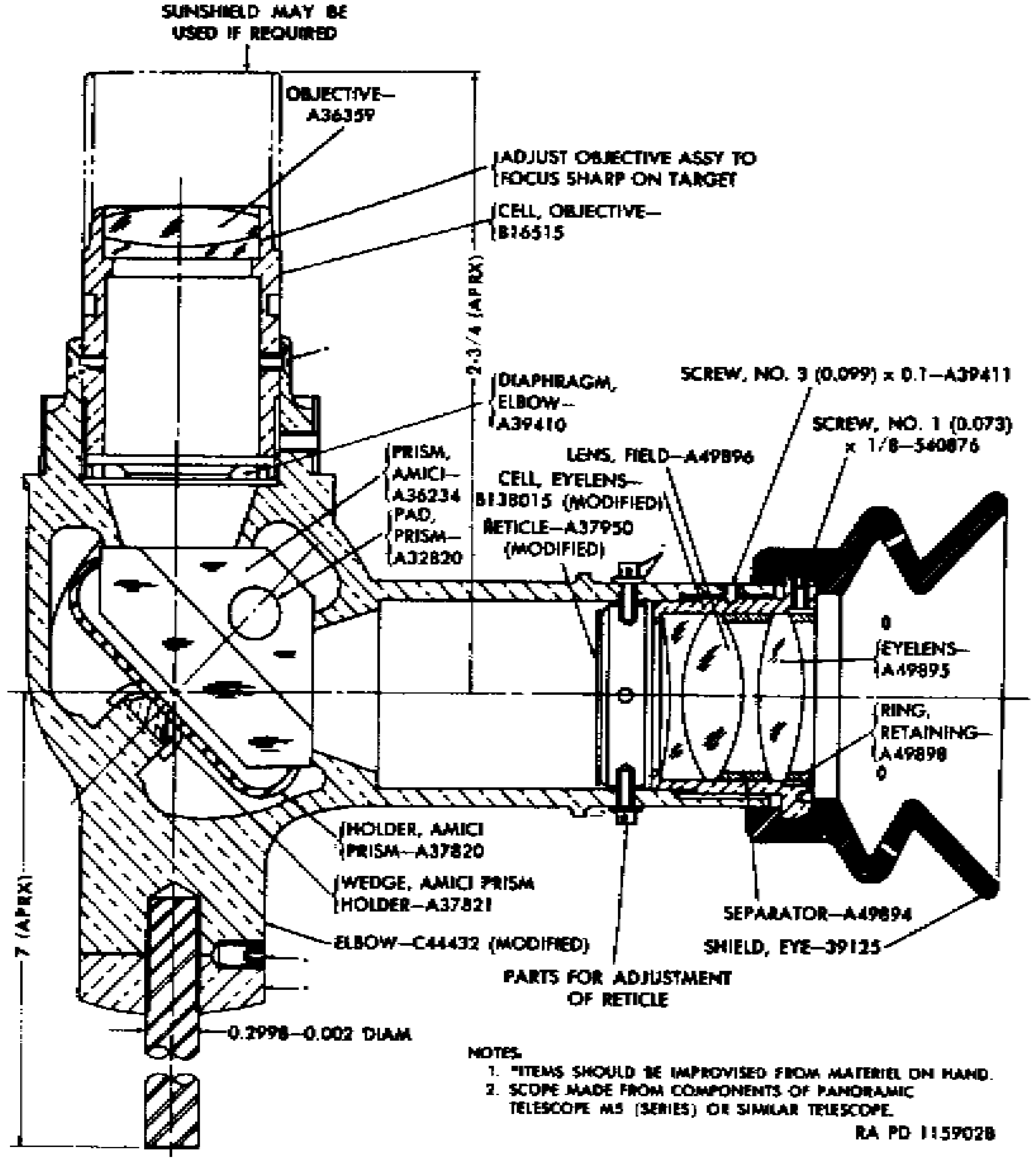


Figure 42. Bore sighting scope, for carbine, cal. .30.

(3) A single cleaning of the bore and chamber of function fired weapons using steam or hot water (at not less than 200° F.) is acceptable in lieu of the repeated cleaning specified in (1) above. The steam or hot water may be applied by a manually directed hose or by machine. After the bore and chamber are dried by air blast, scrub the bore and chamber with a snug fitting wire brush which has been dipped in rifle-bore cleaner and pass dry patches through the bore and chamber followed by one patch saturated with rifle-bore cleaner.

Section II. REBUILD FLOW CHART AND OPERATIONS ROUTE SHEET

26. Flow Chart

A flow chart illustrating the sequence of operations necessary during rebuild of the weapon is provided in figure 44. This chart is intended for the information of depot maintenance organizations rebuilding

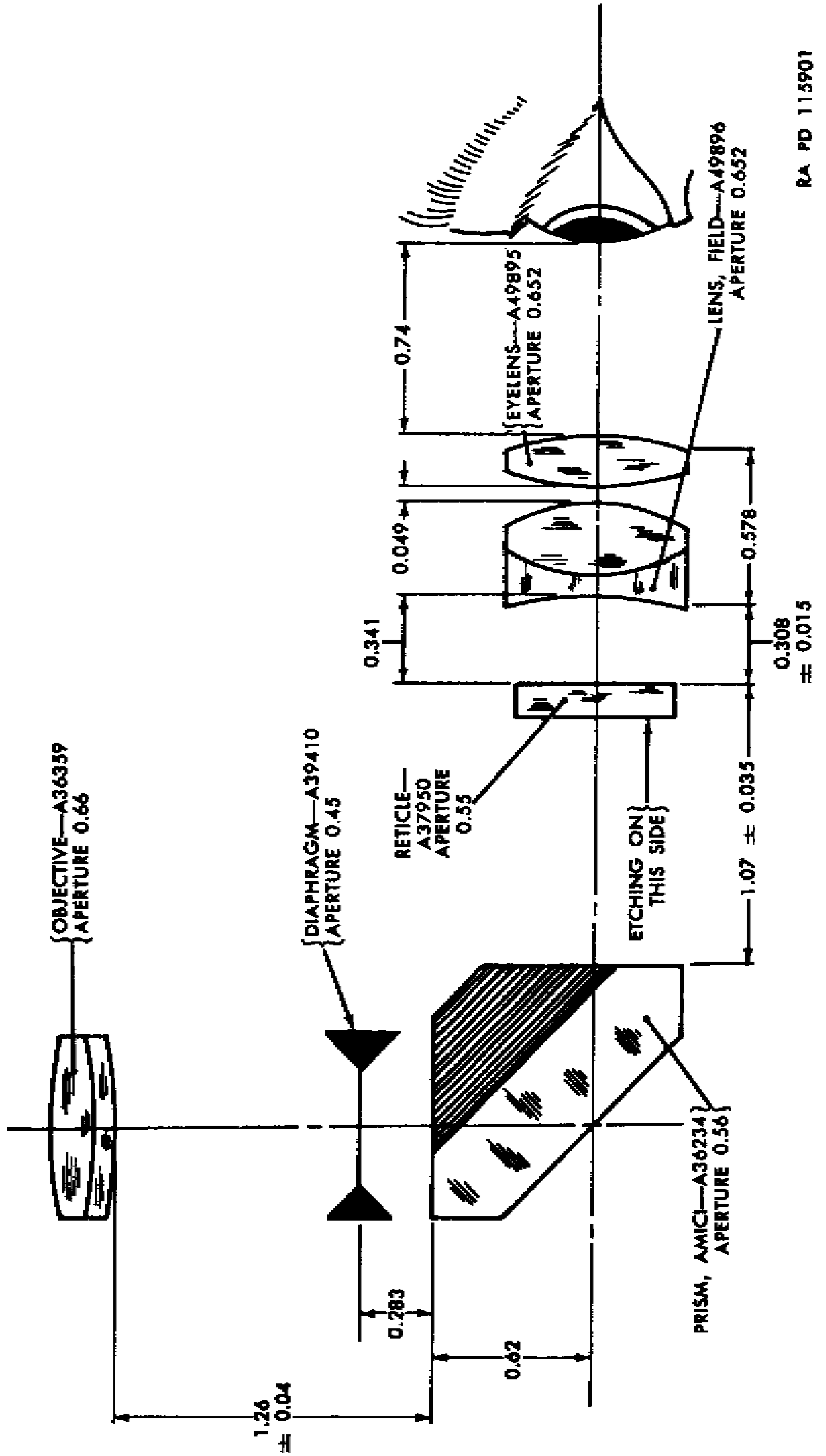


Figure 43. System, optional for scope, bore sighting carbine, cal. .30 power 4X.

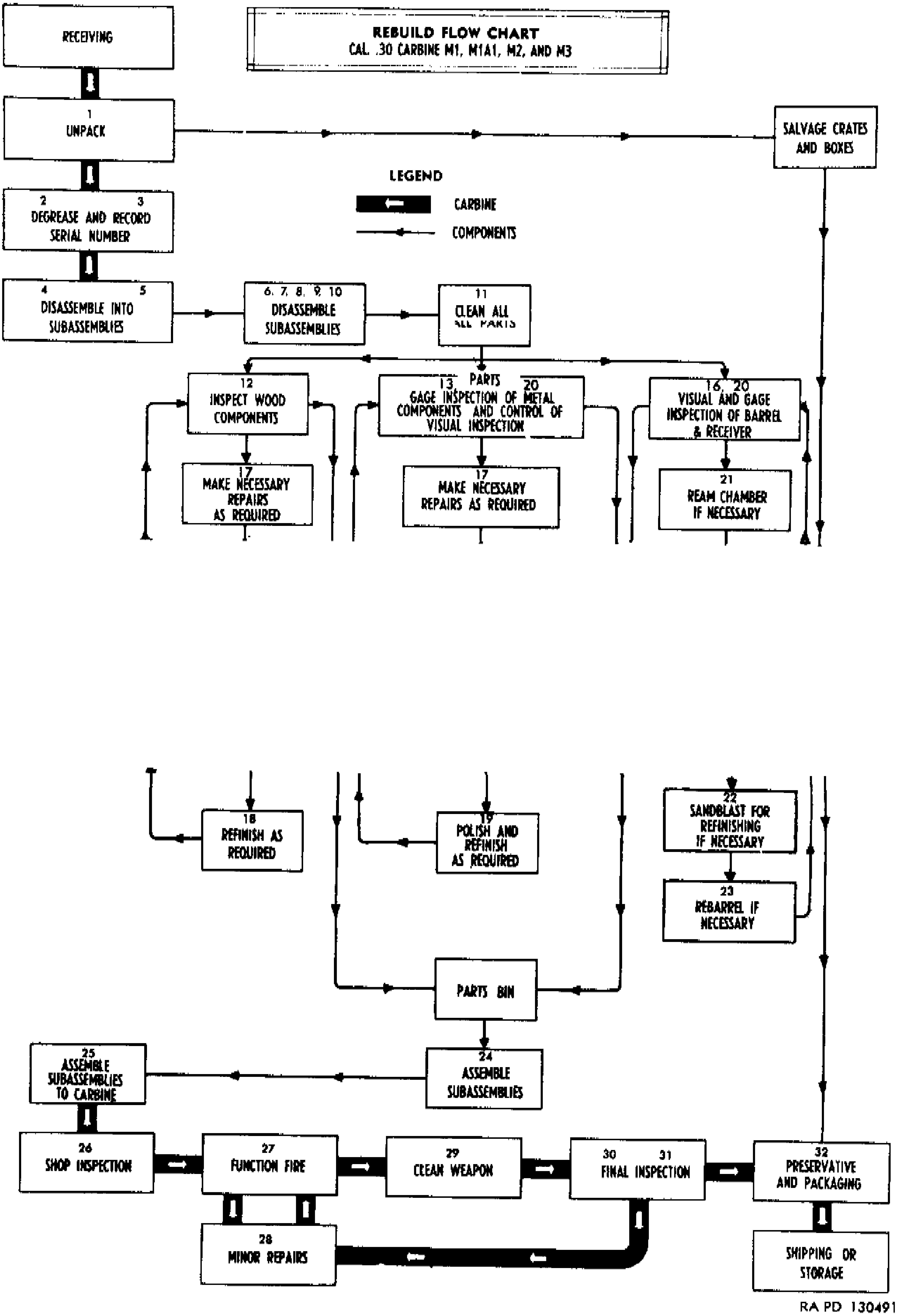


Figure 44. Rebuild flow chart.

the weapon by assembly line procedures for return to stock. The flow chart and the operations route sheet are provided to assist the shop foreman in shop layout, job assignments, and setting up for rebuilding a quantity of weapons. It contains information on authorized modifications current at the time of this publication's preparation. Check the listing in the current SR 310–20–4 for any additional modification work orders or technical bulletins which would require additional set-ups.

27. Operations Route Sheet

The following information supplements the rebuild flow chart (fig. 44). The operations numbers correspond to the numbers on the chart. Special tools, gages, fixtures, and machines required for an operation are indicated opposite the operation.

Table V. Operations Route Sheet for cal. .30 Carbines M1, M1A1, M2, and M3

Operation No.	Operation	Machine	Fixtures	Tools	Gages
1	Unpack				
2	Check for live ammunition				
3	Degrease	Vapor degreasor			
4	Record serial number				
5	Remove stock and hand guard				
6	Disassemble into subassemblies				
7	Disassemble trigger housing group			7160026	
8	Disassemble bolt			7313298	
9	Disassemble operating slide				
10	Remove gas cylinder piston and nut if necessary	Vise		5621065 or 7160995	
11	Remove front and/or rear sight if necessary	Vise		7160026 7312068	
12	Clean all parts				
13	Inspect stock and hand guard for dents, mutilation and cracks				
14	Inspect trigger housing and components. *a.* Inspect for wear. *b.* Check to see that new type hammer and spring are used for the carbines M1 and M1A1. *c.* Check to assure that rotary safety is used on all carbines. *d.* Check to see that new type magazine catch is used. *e.* Check to see that latest safety and magazine catch plunger assembly is used.	Comparator	7319701 7319811 7319882		7317838 7317839 7317840

238463 O—53——5

Table V. Operational Route Sheet for cal. .30 Carbines M1, M1A1, M2, and M3—Continued

Operation No.	Operation	Machine	Fixtures	Tools	Gages
15	Inspect operating slide group *a.* Inspect for wear and cracks of slide. *b.* Check to assure that new type stop and spring are used. *c.* Inspect slide spring and guide for rust, deformation and wear.				
16	Inspect bolt *a.* Inspect for wear. *b.* Check to assure that new unused extractor, spring and plunger (new type) are used. *c.* Check for modified or new type firing pin.				
17	Inspect barrel and receiver *a.* Check for looseness and alinement. *b.* Inspect for wear and cracks in receiver. *c.* Inspect barrel and receiver for serviceability. *d.* Inspect gas cylinder group. *e.* Check for obscured serial number. *f.* Check head space.	Vise			7319932 7319934 7319936 7319938 7319943
18	Make replacement of parts, and repairs as required				
19	Refinish as required				
20	Polish and refinish as required				
21	Inspect				
22	Ream chamber if necessary and check head space	Vise		7319906	Gages as above.
23	Sandblast for refinishing if necessary				
24	Rebarrel if necessary and check head space	Vise		7113308	Gages.
25	Assemble subassemblies			7160026 7160995 or 5261065 7161313 7312068 7313298	
26	Assemble subassemblies to carbines				
27	Inspect				
28	Function fire				
29	Do necessary repairing *Note.*—Repeat operations 26 and 27 if repair work is performed.				
30	Clean carbine				
31	Final inspection				
32	Record serial number (optional)				
33	Preserve and pack				

Section III. TRIGGER HOUSING GROUP, CARBINES M1 AND M1A1

28. Disassembly

a. Refer to FM 23-7 for instructions on the removal and disassembly of the trigger housing group.

b. To facilitate the removal and installation of the trigger spring (fig. 45), tool 7160026 (fig. 6) has been devised, to be used as follows:

(1) Remove the stock from the carbine.

(2) Insert the tube portion of the trigger spring removing tool (fig. 46) in the recess in the rear of the trigger housing containing the trigger spring; compress and retain the trigger spring within the tube of the tool.

(3) Turn the handle of the tool one-quarter turn counterclockwise.

(4) Withdraw the tool and spring while pushing the handle of the tool slightly to the right.

29. Inspection

a. General. Inspect all parts for damage, excessive wear which might cause malfunction, burrs, rust, foreign matter in recesses, deformation, and free action with mating parts.

b. Trigger Housing (figs. 45 and 47). Inspect housing for deformation, worn (elongated) or burred pinholes, worn or burred retaining lugs, bent trigger guard bow, foreign matter in recesses, burred magazine catch guideway, and rust. Some of the fabricated (brazed) type of housings were cyanide hardened during manufacture and some were not. The pinholes of the earlier ones, which were not hardened, are more subject to wear. Inspect the trigger housing group for looseness, and operation. The group should assemble easily to the receiver without apparent looseness or side play. Forward or rearward movement due to clearance at retaining pin should not exceed approximately 0.006 inch by hand test.

c. Trigger Housing Retaining Pin (fig. 45). Old type of trigger housing retaining pin (with springs) must be discarded and replaced with new type of retaining pin (fig. 48). (New type pins have no spring.) Inspect retaining pin for wear, burrs, and rust.

d. Hammer (fig. 45).

(1) *Depot maintenance.* Inspect the hammer on a comparator where facilities are available (par. 79). This applies to hammers removed from used carbines; in general, new hammers removed from stores do not require comparator inspection.

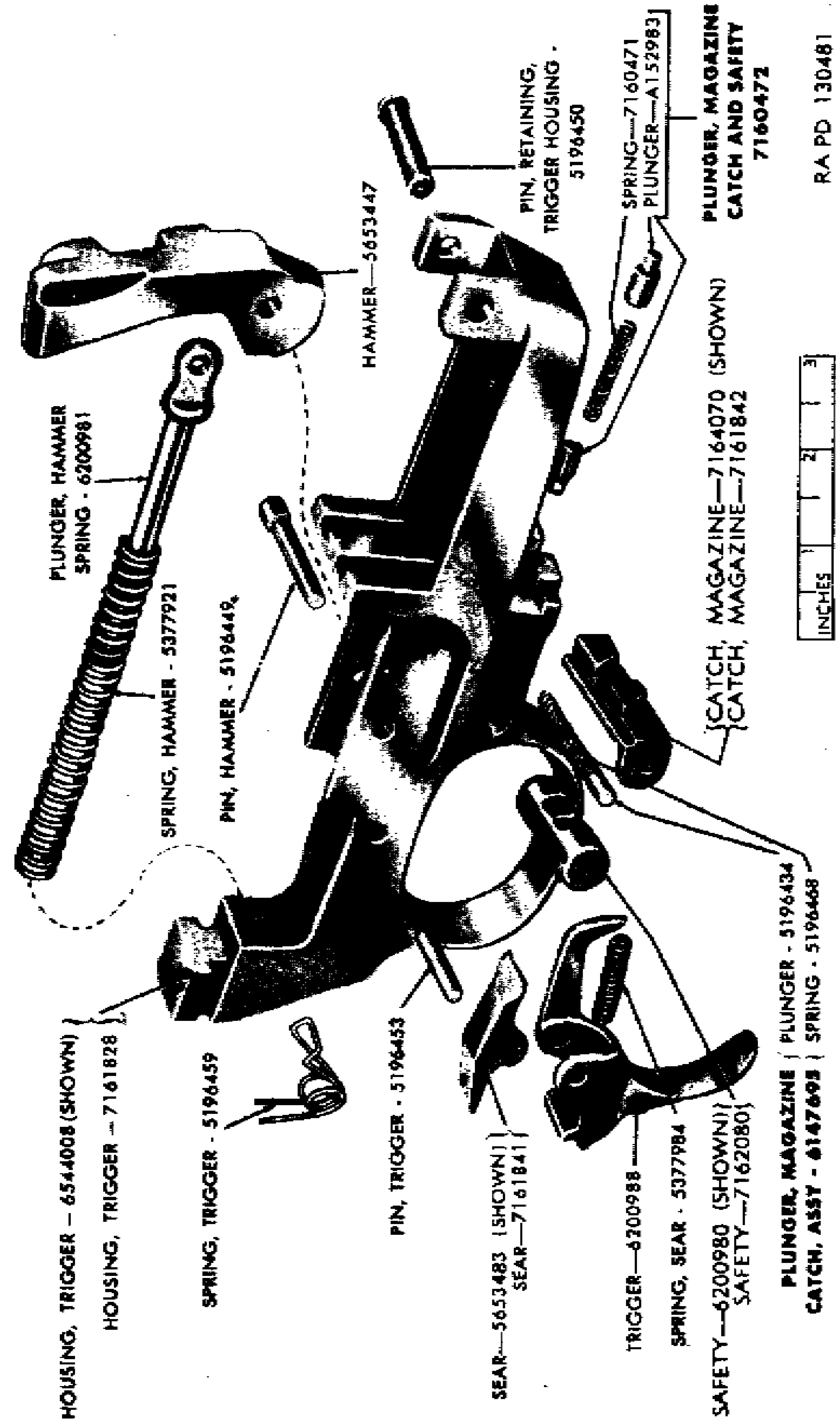


Figure 45. Trigger housing assembly for carbines M1 and M1A1—exploded view.

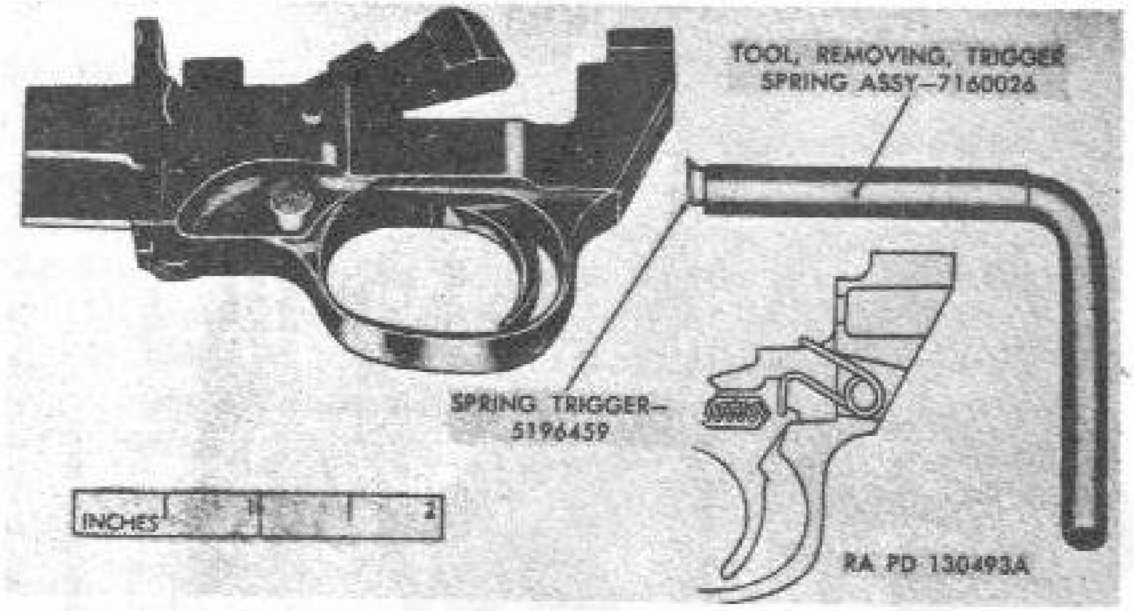


Figure 46. Trigger spring removal and installation.

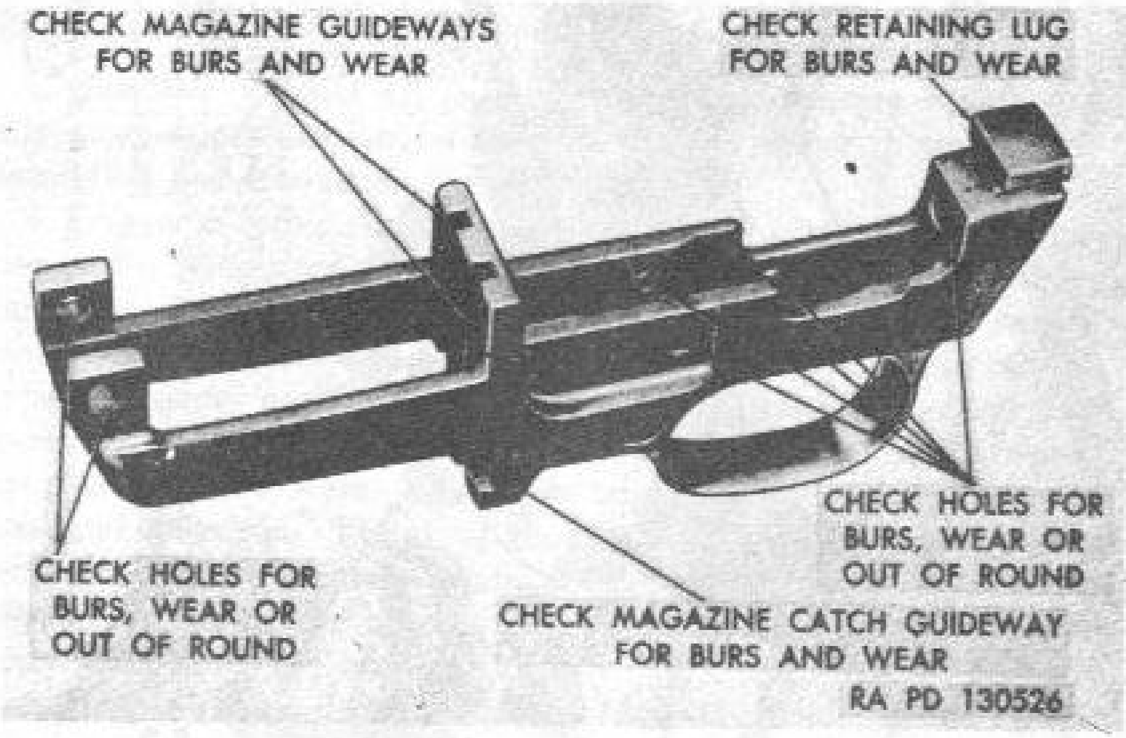


Figure 47. Trigger housing inspection points.

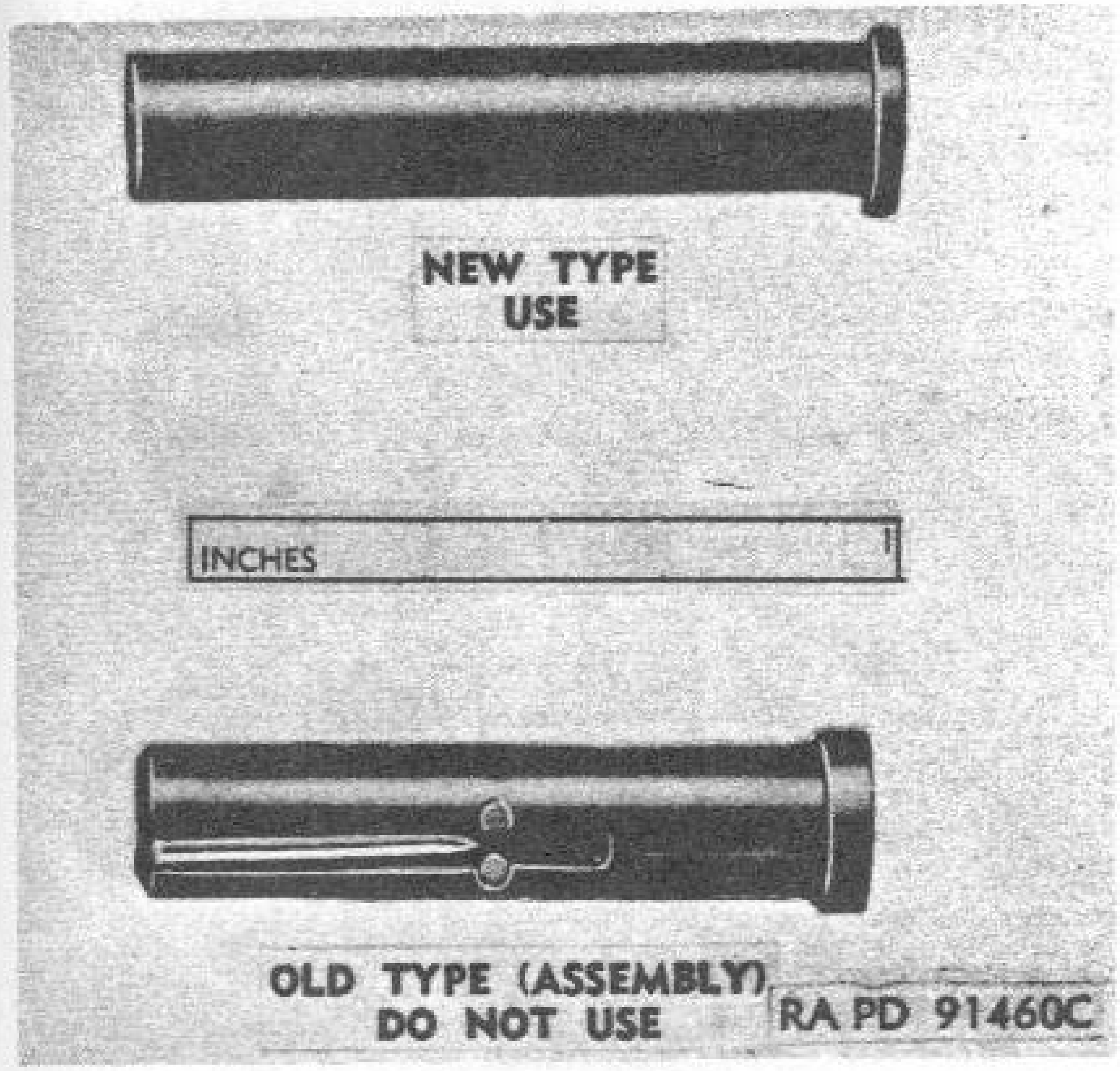


Figure 48. Trigger housing retaining pin.

(2) *Field or depot maintenance.* Where comparators are not available check hammer for worn pinhole, burred or dented face or bolt cam, worn or burred plunger retaining slot, burrs, and rust. Check to see that cocking cam is in good condition and that the corner of the sear notch is not rounded or broken. This corner must be reasonably sharp. Any evidence that the sear notch has been stoned is cause for rejection. Bearing face of sear notch should be level as determined by visual check (fig. 49). Inspect hammer pin for wear and burrs, hammer for looseness on pin, and pin for looseness in trigger housing. Movement of hammer or pin should be free, but without shake. Inspect trigger housing, at point of contact with stop lug or left face of hammer, for wear and burrs.

Note. Replace early design hammer C57146 with hammer 5653447 of recent design (fig. 49).

e. Hammer Spring and Plunger (fig. 45). Inspect hammer spring plunger for deformation, wear, burrs, and rust. Inspect fit of head of plunger in slot in rear face of hammer. Head should seat evenly and positively in slot. Inspect hammer spring for functioning, deformation, and set.

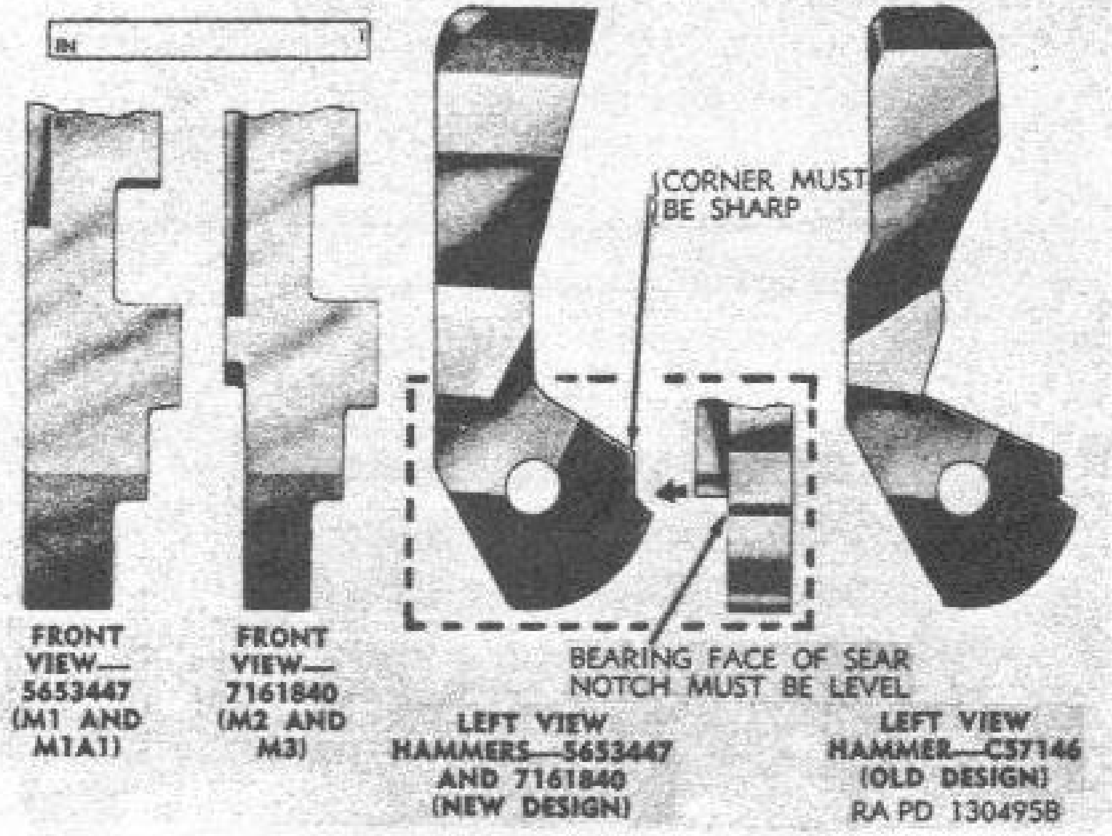


Figure 49. Old and new design hammers for carbines M1, M1A1, M2 and M3.

Note. Replace early design hammer springs that had a free length of 2.125 inches, 22 coils, and wire diameter of 0.046 inch with hammer spring 5377921 of recent design that has a free length of 2.616 inches, 26.5 coils, and wire diameter of 0.042 inch (fig. 50).

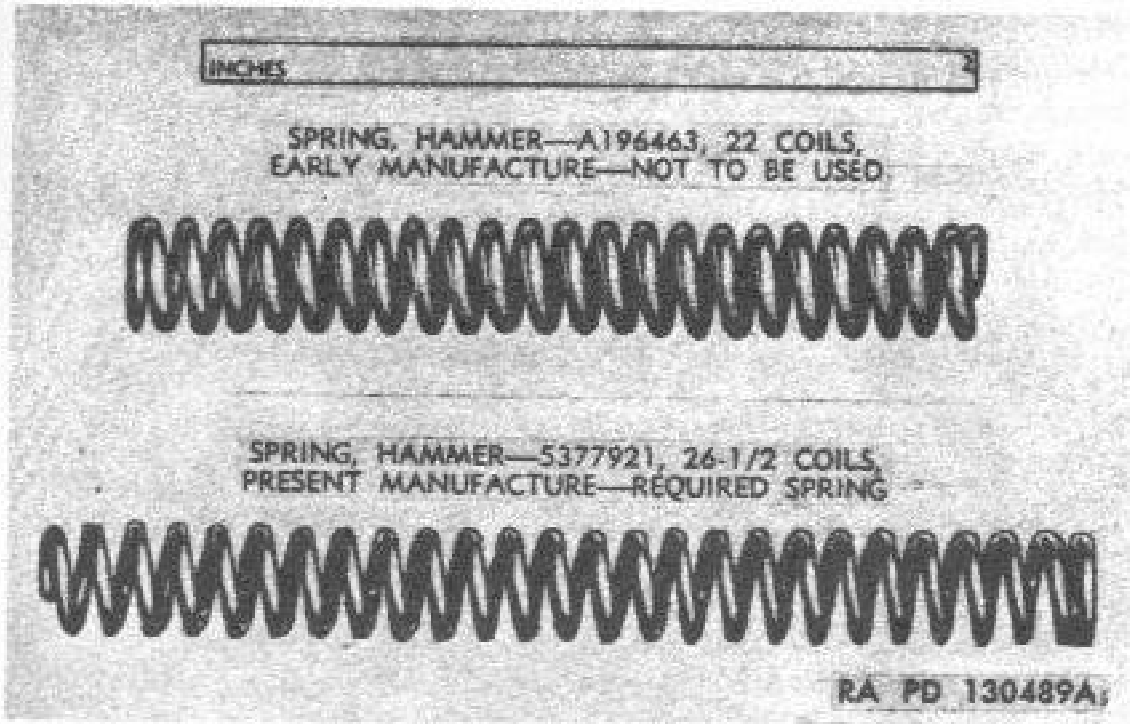


Figure 50. Hammer spring—early and recent design.

f. Trigger (figs. 45 and 51).

(1) Inspect the trigger on a comparator (depot maintenance) where facilities are available (par. 77). This applies to triggers removed from used carbines; in general, new triggers removed from stores do not require comparator inspection.

(2) Where comparators are not available, inspect trigger for movement on trigger pin and pin for seating in trigger housing. Trigger should rotate freely on pin but have no shake. Pin should fit snugly in housing with a push fit. Inspect clearance of trigger tip with guard, and rear of trigger with housing when fully retracted.

(3) Inspect top of pedestal where sear seats when hammer is cocked, for levelness, wear, and burrs, and check to assure that the top forward corner of the pedestal is not rounded or broken. This corner should be reasonably sharp. Triggers that are rejected for high pedestal (as determined by comparator test—DEPOT MAINTENANCE ONLY) will be retained in the shop until a sizable quantity has accumulated, whereupon disposition instructions should be requested from Chief of Ordnance, Washington 25, D. C., ATTENTION: ORDFM. Check trigger spring notch for burrs and foreign matter. Check forward end of trigger which engages with safety for deformation and burrs. Check sear spring seating recess for foreign matter.

(4) Test functioning of trigger to determine that trigger returns smoothly to its forward position with no tendency to stick or hang (table IV, par. 17).

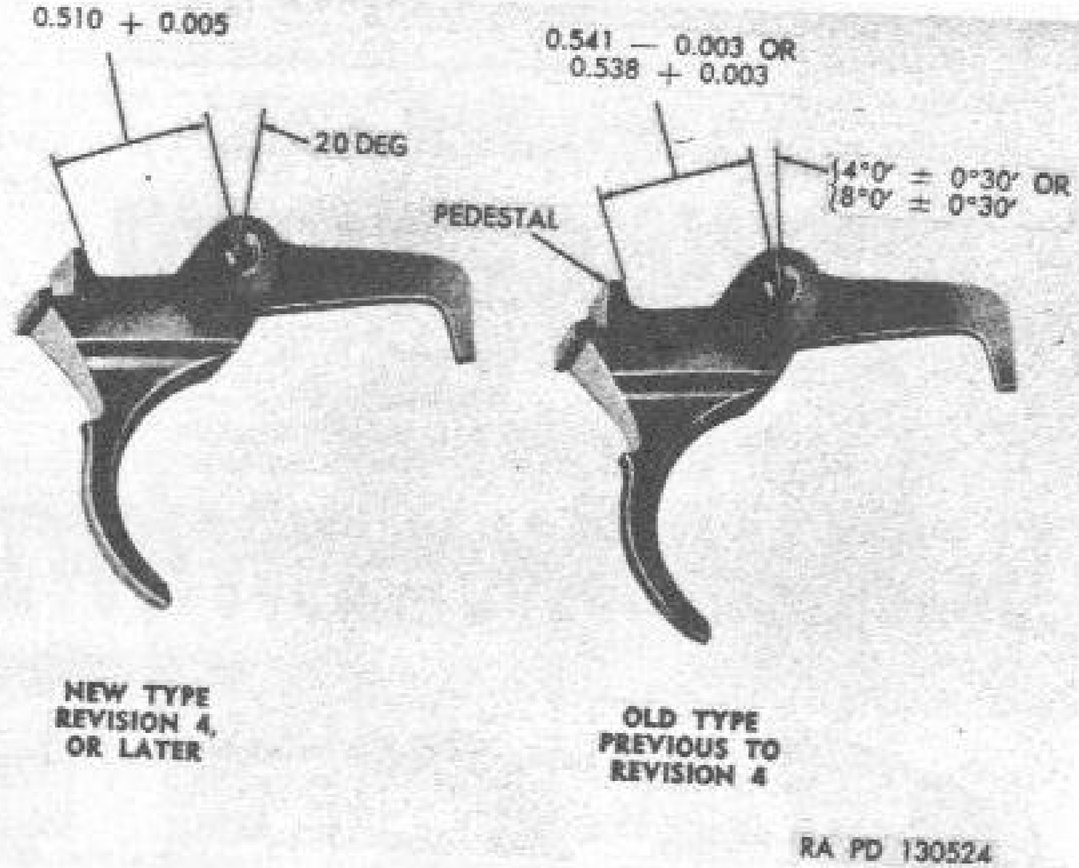


Figure 51. Trigger 6200988.

g. Trigger Spring (fig. 45). Check trigger spring for deformation and rust. Check seating of spring in seating notch in trigger and positive retention spring in housing aperture. Bow end of spring should seat level in bottom of seating notch in trigger, and rear coiled section should be held firmly in housing aperture by the force of spring tension. Tips of spring should be slightly spread. Trigger spring should return trigger to forward position under adequate tension (FIELD MAINTENANCE).

h. Sear (fig. 45).

(1) Although sear 7161841 can be used in carbines M1 and M1A1, the available stock should be conserved for carbines M2 and M3.

(2) Inspect the sear on a comparator (DEPOT MAINTENANCE ONLY) where facilities are available (par. 78). This applies to sears removed from used carbines; in general, new sears removed from stores do not require comparator inspection.

(3) Where comparators are not available inspect sears carefully. The nose should have a "fine grind" surface and should have a small radius at the point where it contacts the sear surface of the hammer. The surface at the extreme rear end should be flat ground and the lower corner or edge should be sharp. Some sears 6200978 have been properly ground at each end

and are usable. In this connection reference is made to figure 52, which is correct as far as it goes but is not complete. Sears 5653483 with the grind quality were manufactured without either of these identifying marks and these also should be used if otherwise serviceable. The important point is to assure that all sears used are those on which the nose and rear end are properly ground as mentioned above. Questionable sears should be retained in the shop until a sizable quantity is accumulated, whereupon disposition instructions should be requested of Chief of Ordnance, Washington 25, D. C., ATTENTION: ORDFM. This does not mean that all of the sears that can be determined unserviceable by visual inspection should be retained.

(4) Check sear for movement on trigger pin. Sear should rotate freely about pin and have backward and forward movement due to elongated pinhole but should have no vertical play. Check pinhole for excessive wear.

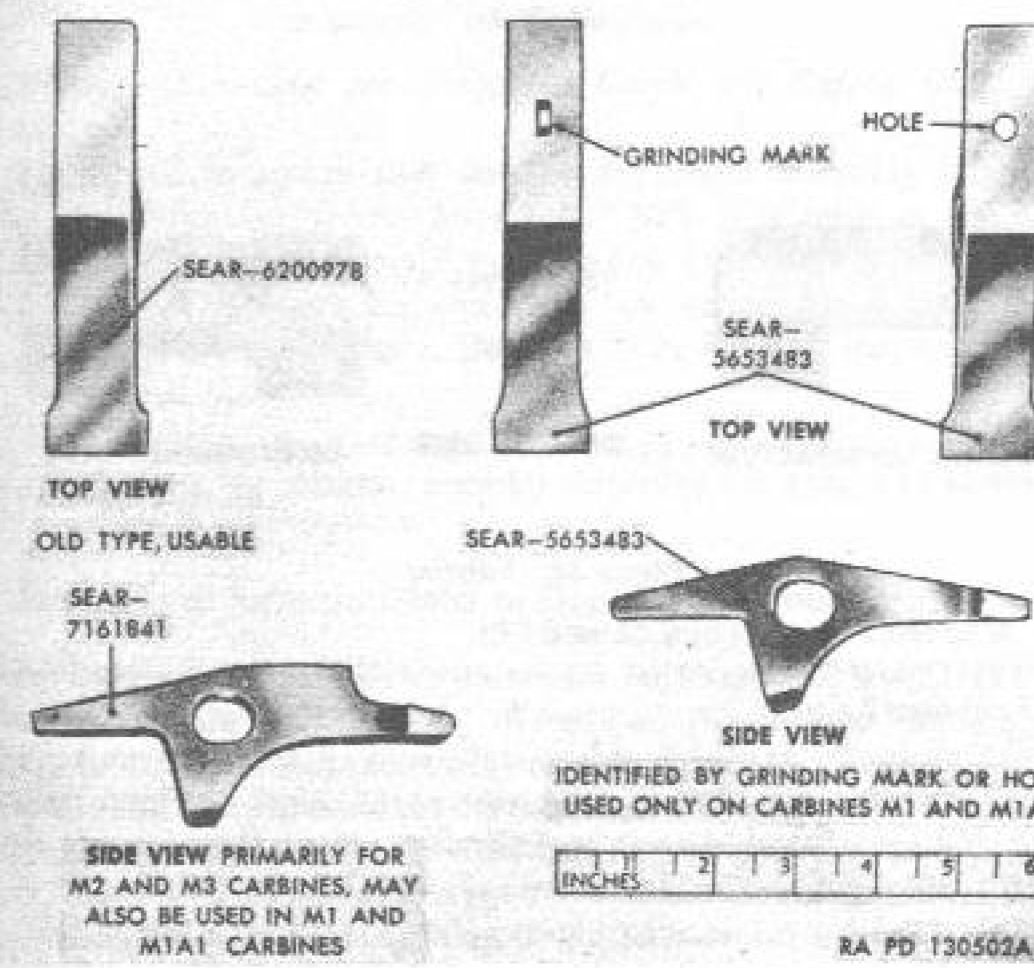


Figure 52. Sears—usable types.

i. Sear Spring (fig. 45). Check sear spring for positive seating in trigger and sear, and for functioning, rust, and set. Visually inspect during repair. Replace during rebuild.

j. Safety (figs. 45 and 53). Check to assure that only the rotary type safety 7162080 is used. Modification Work Order ORD B28–W–6 prescribes the replacement of the old type safety with the new type (fig. 53). Test safety for positive positioning. Check for burrs and rust and check spring plunger recess and trigger slot for burrs and foreign matter. Refer to paragraph *l*(1) and (2) below for inspection of plunger assembly for magazine catch and safety.

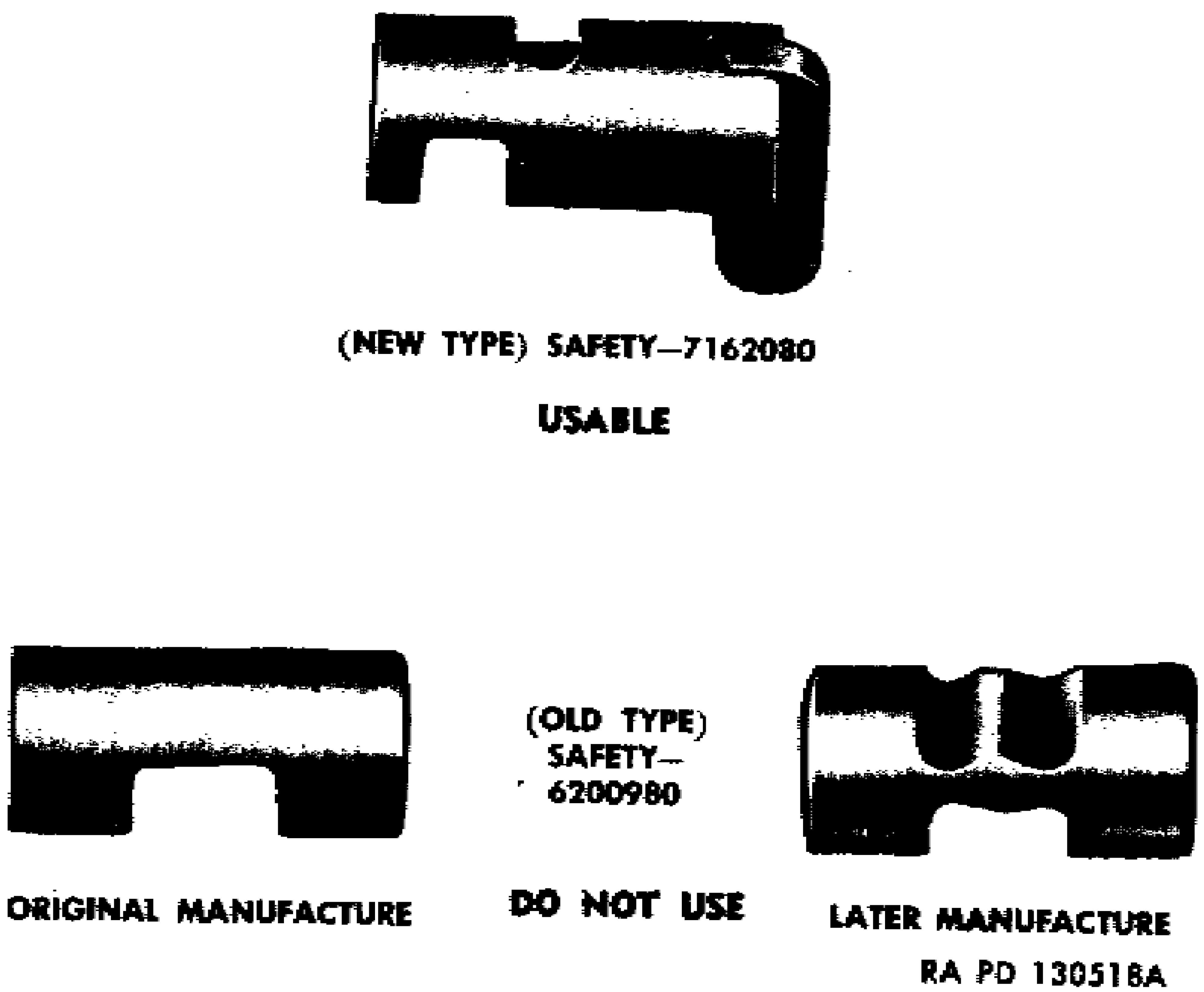


Figure 53. Safeties.

k. Magazine Catch (figs. 45 and 54).

(1) Check to assure that magazine catch 7161842 (marked with "M" underlined) or 7160470 (marked "M" not underlined) is used. Although they are interchangeable, stocks of catch 7161842 should be conserved for carbines M2 and M3. Modification Work Order ORD B28–W–4 prescribes replacing the old type catch with the new type (fig. 54).

(2) Test the function of the magazine catch. Check catch for free movement in guideway, deformation, worn or burred retainer plunger recess, and worn or burred magazine retention lugs. See that projection on end of catch 7161842 is neither bent nor burred. Check magazine catch spring plunger for retention on spring, wear, and burrs, and check spring for functioning, deformation, and set. See table III, for standards on magazine catch spring. When magazine catch spring is assembled, last coil of spring is contracted slightly and fits into groove in shank of plunger for retention.

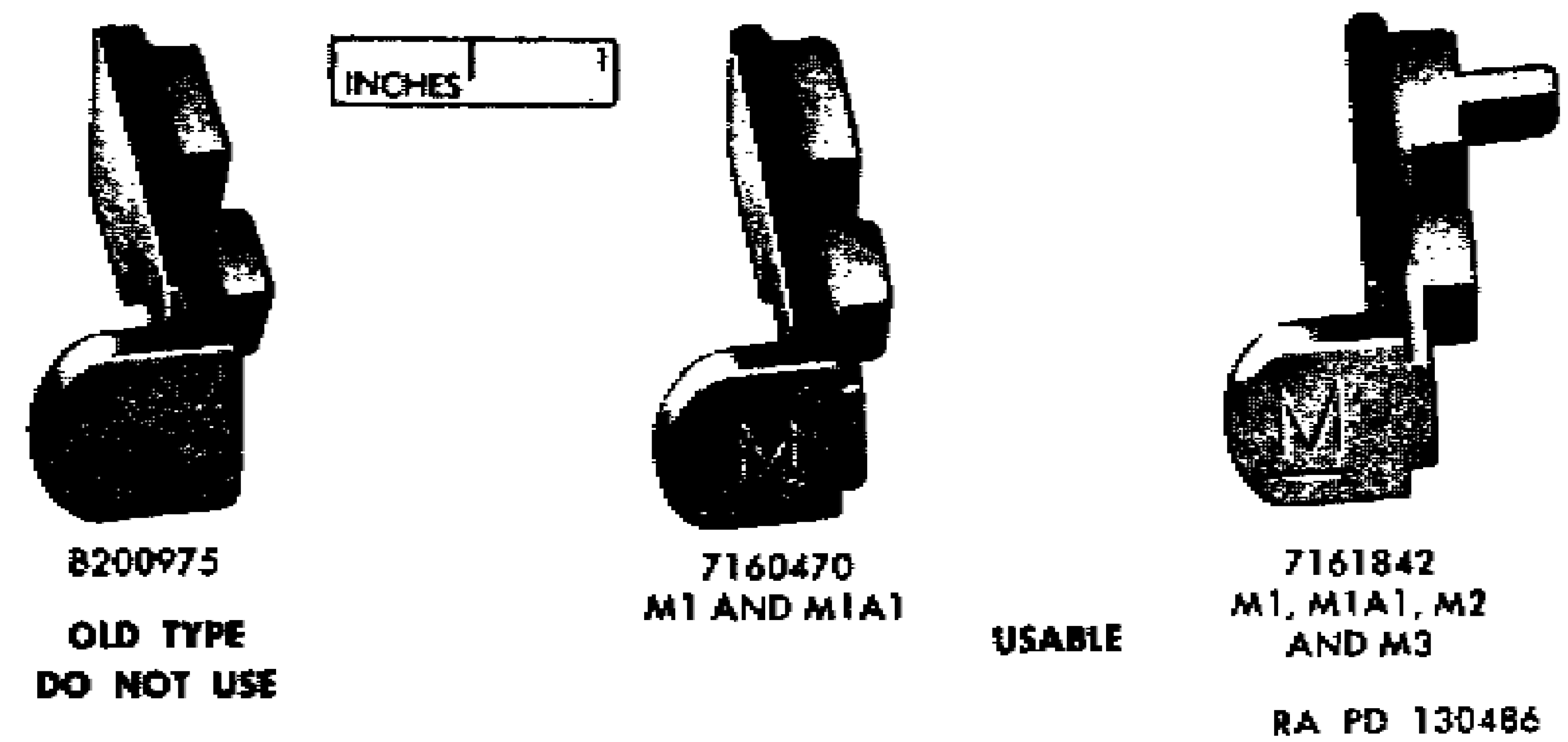


Figure 54. Magazine catches.

l. Plunger Assembly for Magazine Catch and Safety (figs. 45 and 55).

(1) Check to assure that new type plunger assembly is used. Modification Work Order ORD B28–W–4 replaces the old type plunger assembly with the new type (fig. 55).

(2) Check plungers for wear and the spring for functioning, deformation and set. Refer to table III, for inspection information.

Note. Use figure 55 only as a guide and not as a basis for rejection. Function test of plunger assembly during function firing is an adequate criterion for acceptance.

30. Repair and Rebuild (Field or Depot Maintenance)

a. General. Replace all broken, worn, or otherwise unserviceable parts. Remove burrs and rust. Weapons must have all applicable modifications, and instructions contained in future technical bulletins must be followed. Note that certain components for carbines M2 and M3 are not interchangeable with those of the carbines M1 and M1A1, although some designed for the former can be used on the latter.

b. Hammer Fails to Cock. This condition may be due to damaged sear, broken sear spring, burrs or foreign matter in sear notch in hammer, or failure of bolt to move far enough to the rear on recoil movement to cock hammer. Examine parts; clean and replace if necessary.

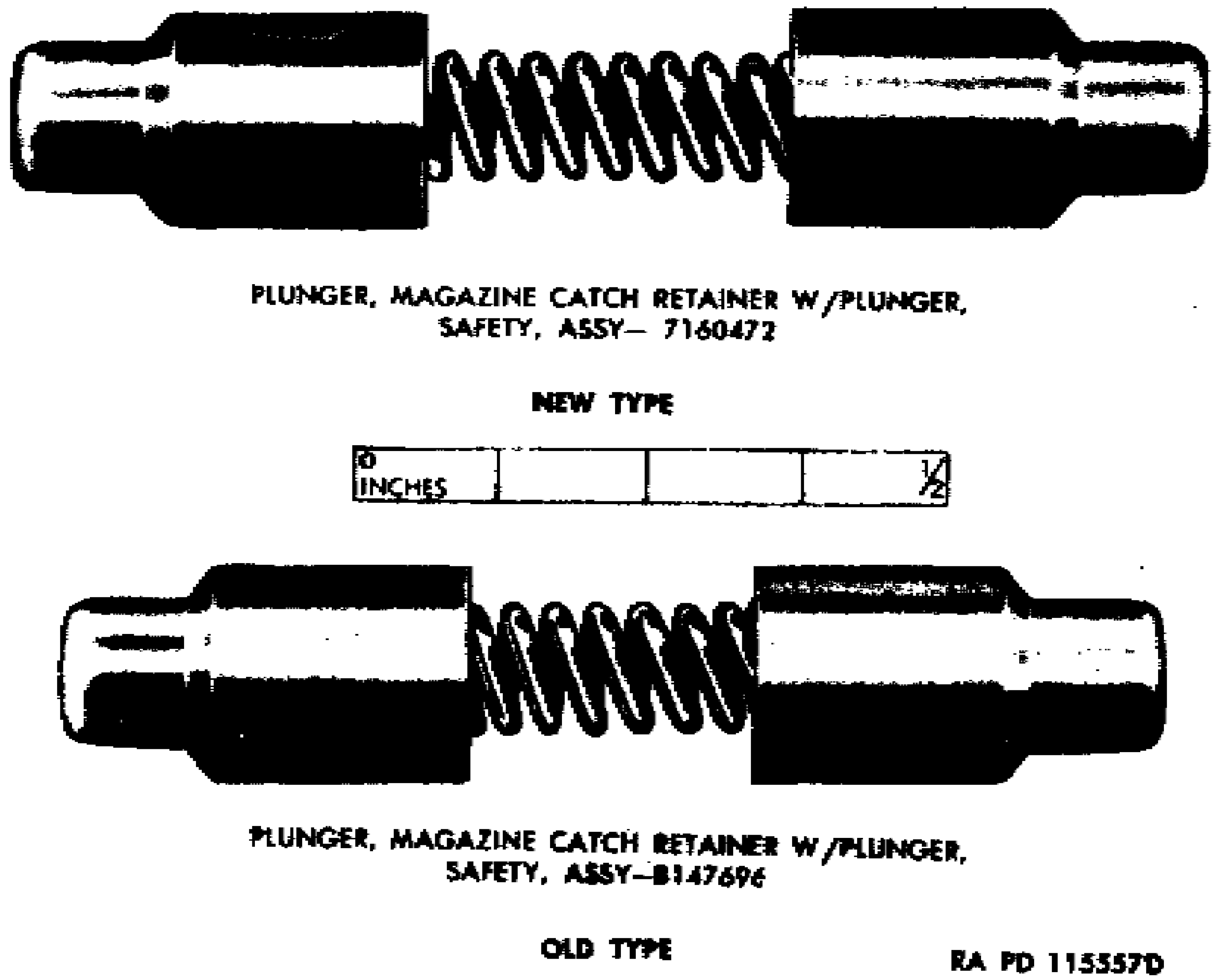


Figure 55. Plunger assemblies for magazine catch and safety.

c. Correcting Trigger Pull.

(1) A light or heavy trigger pull may be caused by foreign matter or burrs in the sear notch in the hammer, on the nose of the sear, on the top of rear end lip of trigger where the rear end of sear rests, or in the elongated pivot hole in the sear. Such burrs or foreign matter will prevent nose of the sear from seating fully in hammer notch. To correct, remove foreign matter or replace with new components from stock (par. 29*d*, *f*, and *h*).

(2) A light pull may also be due to a weak or broken sear spring which will not seat the sear fully in the hammer notch before the pressure from hammer spring is applied to the nose of sear through the hammer. Correct by replacing sear spring.

(3) Uneven surface of hammer notch or worn nose of sear may alter trigger pull. Correct by replacing sear or hammer.

d. Trigger Hang. Triggers of early manufacture had a 4- or 8-degree angle on the forward face of the pedestal which was conducive to trigger hang. When trigger hang exists, and it is not due to malfunction of the trigger spring, it can be eliminated by replacing the trigger with one of recent manufacture having an angle of 20° on the forward face of the pedestal (fig. 51). Surface must be smooth.

e. Trigger Housing Loose on Receiver.

(1) If T-shaped lug on rear end of trigger housing becomes worn so it becomes a loose fit in retaining L-shaped lugs on rear end of receiver, peen lightly to spread lug, then file to fit. The trigger housing must be readily dissassembled from receiver.

(2) The forward lugs of trigger housing may be similarly treated to attain close fit.

Caution: Do not peen or squeeze in the lugs on the receiver as they are hardened. Any attempt at tightening should be done by peening of trigger housing lugs when necessary.

f. Safety Sticks. If the safety sticks when turned the 90°, the safety spring plunger is burred or missing or the plunger seats in the safety are burred or too deep. Stone the safety for proper retention of the plunger or replace with new safety. Replace plunger or spring as required.

31. Assembly

a. Refer to FM 23–7 for instructions on the assembly of the trigger housing group.

b. Using trigger spring removing tool 7160026 (fig. 46) replace the trigger spring by reversing the procedure of removal (par 28*b*). When the spring is in position in the retaining groove of the trigger, depress the trigger and withdraw the tool from the housing. Install the stock on the carbine.

32. Functional Check

a. Cock hammer and check seating and positive retention to limit of sear nose in hammer notch. Continue to retract hammer rearward and observe forward movement of sear to maintain retention. Sear should continue to contact hammer throughout movement. Pull trigger; sear should release hammer crisply. Release trigger. It should move positively to forward position under force of trigger spring and be held there firmly and without shake even when sear is not assembled. When trigger is in forward position and hammer cocked, the sear should rest upon or above top of rear pedestal of trigger.

b. Check trigger pull. See paragraph 15*h* for instructions on the checking of the trigger pull.

c. Check to assure that hammer and sear reengage when trigger is pulled back far enough to cause perceptible movement of hammer and then released.

d. Check to assure that trigger guard is not bent and does not interfere with functioning of trigger.

e. Check to assure that safety functions properly. It should block the trigger when set on safe (tang vertical) and permit release of the hammer when the tang of the safety is pointing to the rear.

f. Check functioning of the magazine catch to assure that it operates properly and does not bind. Inspect each assembly to assure that the magazine catch can be pushed rearward in its ways in the trigger housing, and that the safety plunger spring is strong enough to return it firmly to the forward position. Check each safety by rotating it to both positions to assure that the retention effect of the spring is sufficiently strong to hold it firmly in the position desired. It shall be determined that the forward pressure on the magazine will not prevent proper sidewise travel of the catch.

g. With trigger housing group assembled to the receiver, check to assure against looseness which would affect functioning. The retaining pin must fit tightly enough to remain in position yet permit ready disassembly by hand. The trigger housing group must be readily disassembled from the receiver.

Section IV. TRIGGER HOUSING GROUP, CARBINES M2 AND M3

33. Disassembly (Field or Depot Maintenance)

a. To remove the trigger housing group the disconnector lever must first be removed, as the disconnector lever pin locks the housing to the receiver.

b. To remove the disconnector lever, move the selector to its rearward position and push the selector spring up the slot in the housing magazine post to the dismounting notch and withdraw, using a drift or the operating slide spring guide. Slide the selector off the disconnector lever pin. The disconnector lever can then be withdrawn and the trigger housing separated from the receiver.

c. The disassembly of the trigger housing group is the same as for the carbines M1 and M1A1 (par. 28).

d. To reduce loss of disconnector spring plunger assembly when removing trigger housing group from barrel and receiver assembly of M2 and M3 carbines, MWO ORD B28–W7 prescribes the following changes:

Part No.	*Item*	*Replaces*
7162780	Spring, disconnector plunger	Spring 7161836.
7162781	Plunger, disconnector	Plunger 7161835.

(The above items are components of):

7162782	Plunger, disconnector spring, assembly.	Plunger, assy 7161834.

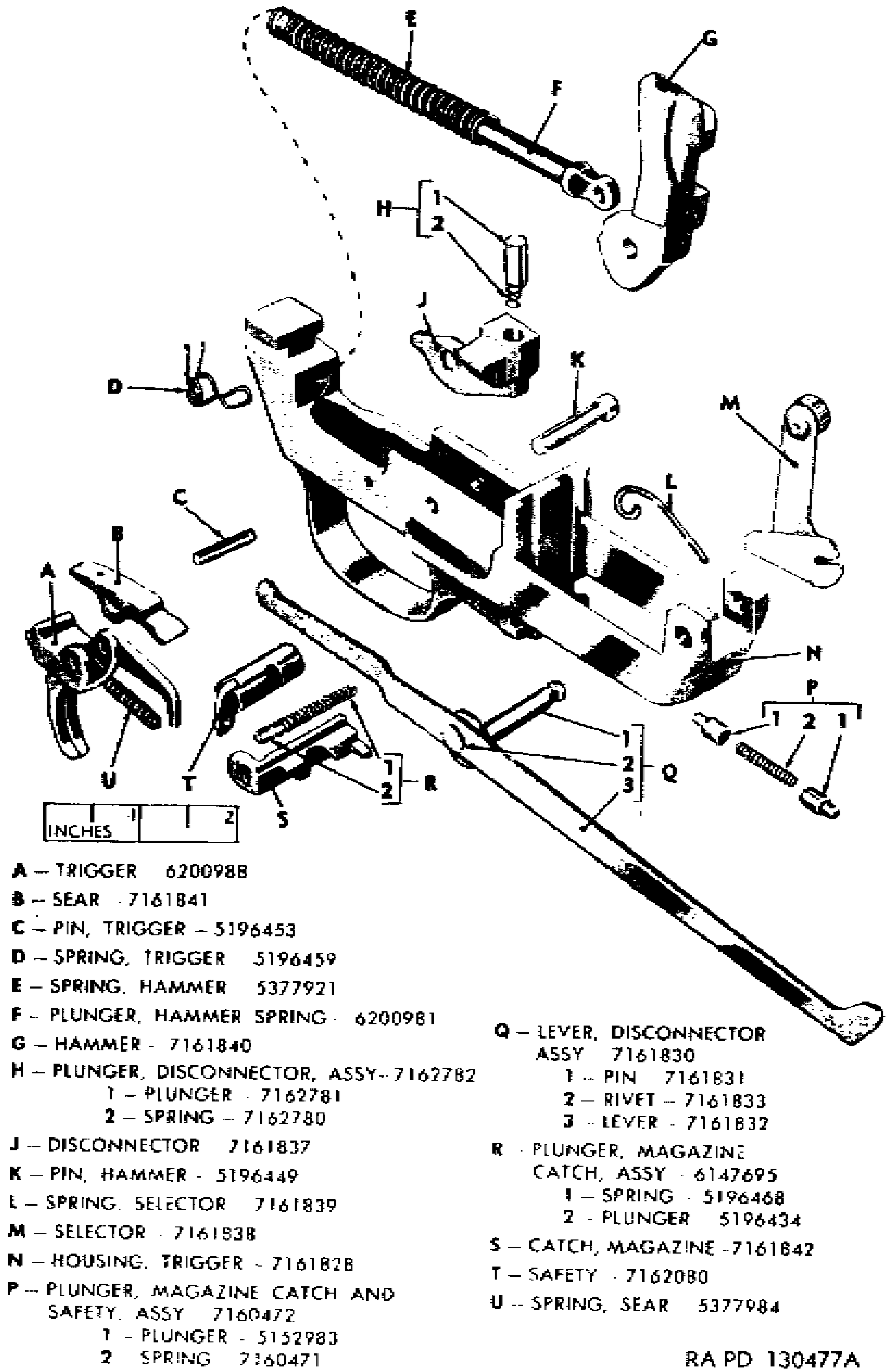


Figure 56. Trigger housing group—carbines M2 and M3.

34. Inspection

a. *General*. Inspect all parts for damage, excessive wear which might cause malfunction, burrs, rust, foreign matter in recesses, deformation, and free action with mating parts. Reference is made below

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to paragraphs in the preceding section, for inspection of corresponding components of the trigger housing group.

b. Trigger Housing (fig. 56). See paragraph 29*b* for inspection of the trigger housing. Also inspect the selector spring retention slot in left magazine post for foreign matter and positive spring seating so that spring will not turn when assembled.

c. Hammer (fig. 56). See paragraph 29*d* for inspection of the hammer. Also inspect milled cut on lower right sight of hammer, which allows clearance for disconnector, for burrs and wear (fig. 49).

d. Hammer Spring and Plunger (fig. 56). See paragraph 29*e* for inspection of the hammer spring and plunger.

e. Trigger (fig. 56). See paragraph 29*f* for inspection of the trigger.

f. Trigger Spring (fig. 56). See paragraph 29*g* for inspection of the trigger spring.

g. Sear (fig. 56). See paragraph 29*h* for inspection of the sear. Also inspect top front portion (camming surface for disconnector) for burrs and wear.

h. Sear Spring (fig. 56). Check sear spring for positive seating in trigger and gear. Check for functioning, rust, and set. Visually inspect during repair. Replace during rebuild.

i. Safety (fig. 56). See paragraph 29*j* for inspection of the safety.

j. Magazine Catch (fig. 56). See paragraph 29*k* for inspection of the magazine catch.

k. Disconnector (fig. 56). See that bearing slot in front end of disconnector is free from foreign matter and burrs and is lightly lubricated. See that disconnector spring is not weak, rusted, or broken, that spring well is free of foreign matter, and that plunger is free of burrs. Lubricate plunger occasionally. Expanded end of coil of spring should seat in plunger for retention. Check rear end of disconnector for burrs and wear.

l. Disconnector Lever Assembly (fig. 56). Examine the rivet of the disconnector lever assembly which pivots the lever in the flat crank shaped end of the pin, to determine that the rivet is secure, that the hole in the crank of the pin is not enlarged, that this pivot is free from burrs, and is not worn. See that lever is not distorted or twisted on rivet, that it is free to rotate on the rivet and that ends are free from burrs and wear. Offset in rear section of lever is for alinement with disconnector and should not be straightened. Be sure toe (front end) of lever bears squarely on cam on operating slide and is (slide retracted) under raised boss when lever is fully seated in the housing. See that holes in trigger housing for pin of disconnector lever assembly are not enlarged. Rear end should not bind in cam of disconnector when assembled. Examine pin of disconnector lever assembly to see that pivot areas are free from burrs and not worn. Keep pivots lightly

lubricated. If the pin is rotated by the selector so as to permit inadequate positioning of lever in full automatic fire, inspect the straddle cuts in pin which engage the selector. They must be free from burrs, must retain selector firmly, and must not be worn so as to cause lost motion.

m. Selector and Spring (fig. 56). See that disconnector pin slot in selector is not worn so it will cause lost motion or impair security. See that spring recess in rear end is free from foreign matter and will retain spring securely. See that selector spring is bent in only one plane (not twisted) and both ends seat securely in their retention recesses. If spring is loose when assembled, straighten slightly.

35. Repair and Rebuild

The repair and rebuild of the trigger housing group is essentially the same as for carbines M1 and M1A1. See paragraph 30.

36. Assembly

a. The assembly of the trigger, trigger spring, sear and sear spring is the same as for the carbines M1 and M1A1 (par. 31). Use sear 7161841 (par. 29*h*(1)) and magazine catch 7161842 (par. 29*k*(1)) (marked with underlined letter "M" on all carbines M2 and M3. To assemble the disconnector and hammer, place the disconnector in trigger housing so that the lug projects over the right side of the housing. Insert the hammer on the left of the disconnector so that its milled lower cut presses against the flat portion of the disconnector. Insert the hammer pin from the left side and through the hole in the hammer, line up the hole in the disconnector and push the pin through the hole in the other side of the housing. With the pin head on the left side, the pin is prevented from shifting when the carbine is assembled.

b. Insert disconnector spring plunger assembly into the hole in the top of the disconnector, spring first. Use disconnector spring plunger assembly 7162782 on all carbines M2 and M3. Line up the trigger housing with the receiver and insert the disconnector lever pin from the right side with the long leg of the lever towards the front. The rear toe of the lever should rest on the bottom surface of the projecting lug of the disconnector. Slide the slot of the selector through the grooves of the projecting portion of the disconnector lever pin. Pivot the selector to the rear position and insert straight end of the selector spring into the recess in the lower rear end of the selector; with the loop of the spring downward insert the loop end into the slot in housing magazine left post mounting slot and down to the bottom of the post.

37. Functional Check

a. For functional check of the trigger housing, hammer, trigger, sear, magazine catch, and trigger pull, see paragraph 32.

b. Set for semiautomatic fire. Squeeze the trigger, cock the hammer, and forcibly strike the grip of the stock with the heel of the hand several times. If the hammer falls, the group is not acceptable because it will tend to fire in an uncontrolled manner.

c. With the trigger housing assembled to the receiver, check functioning of all moving parts at full and semiautomatic settings.

d. Check to assure that there is no binding between hammer, disconnector, and housing.

e. When the carbine M2 is set for automatic fire with the trigger pulled back, the hammer must fall when the operating slide is slowly pushed all the way forward. When set for semiautomatic fire, the toe of the disconnector lever should clear the cam on the operating slide to assure that the hammer will not be released.

f. Check trigger pull (par. 15*h*).

Section V. OPERATING SLIDE ASSEMBLY

38. Disassembly

a. Refer to FM 23–7 for instructions on removal from carbine and disassembly of the operating slide assembly.

b. Before the operating slide on the carbines M2 and M3 can be removed, the disconnector lever must be removed first.

39. Inspection

a. Operating Slide (fig. 57). Check slide for bent or cracked rear bar, deformation, excessively worn guide lugs, burrs, and corrosion. Inspect bolt camming lug recess for wear and burrs. Inspect spring guide seating recess in rear face for wear, burrs, and foreign matter. Inspect front face of slide where it contacts piston for levelness. Uneveness at this point may cause malfunction. Check camming surfaces for burrs and wear (fig. 58). Inspect the operating slide under "black light" for cracks in the areas specified below (DEPOT MAINTENANCE ONLY). Reject slides having cracks around the operating cam, at the junction of the inertia block and arm, and around the disconnector lever cam on M2 type slide 7161843. Check visually and reject operating slides showing breaks around the hole for the operating slide stop. Cracks at this point are acceptable. Use operating slide 5357151 (usable) or operating slide 7160091 (preferred) on carbines M1 and M1A1 until the supply is exhausted, then use 7161843 (fig. 58). Until the supply of the two former slides is exhausted, conserve operating slides 7161843 for use on carbines M2 and M3.

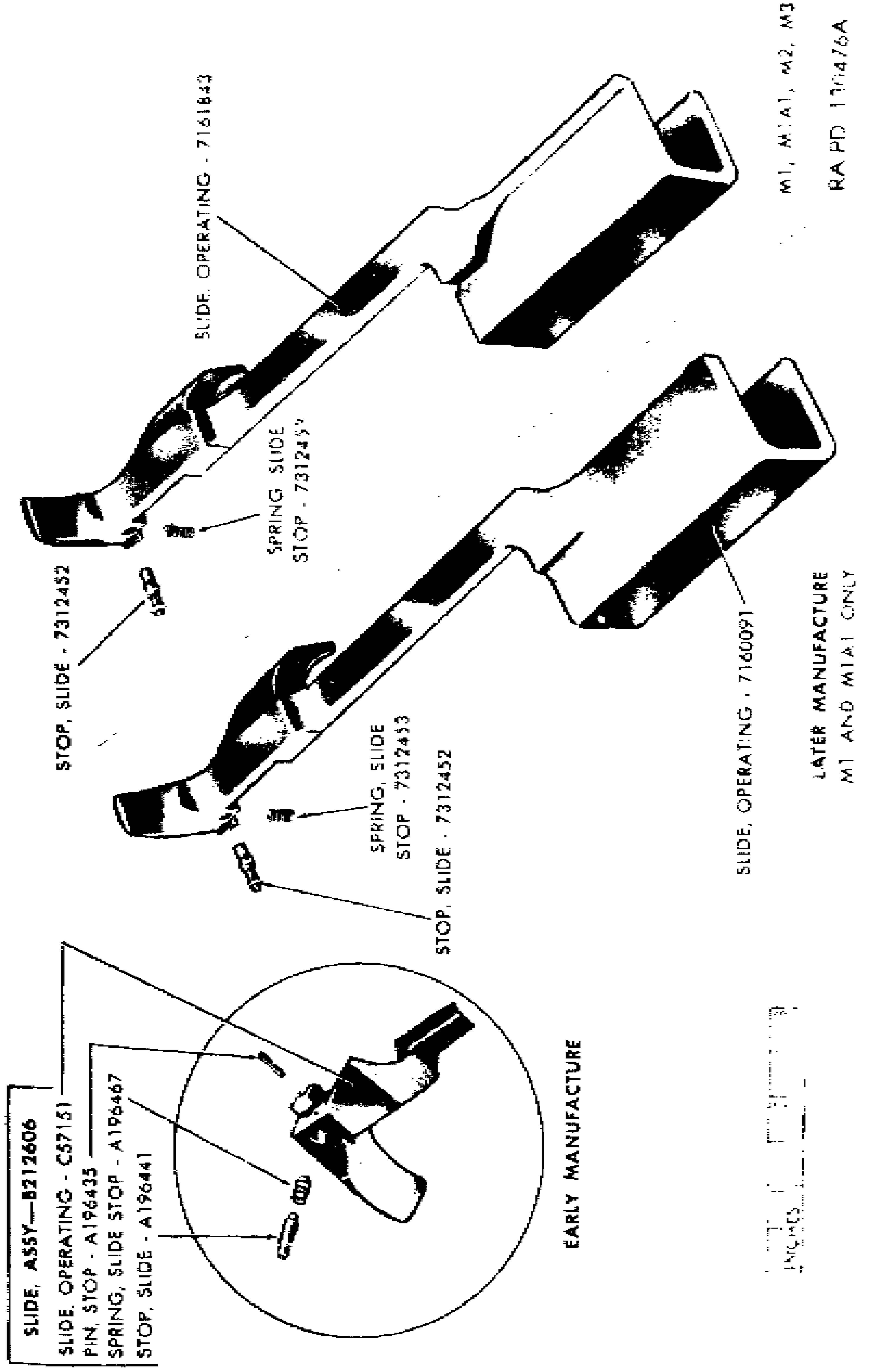


Figure 57. Operating slide assembly.

b. Operating Slide Stop and Stop Spring (fig. 57).

(1) For depot maintenance, check to assure that stop 7312452 and spring 7312453 are used. For field maintenance, old type is satisfactory if it functions properly.

(2) Inspect stop for wear and burrs, looseness in operating slide, and rust. Inspect stop spring for functioning, lack of friction with stop, and for set. Inspect spring for foreign matter.

c. Operating Slide Spring (fig. 74). Inspect operating slide spring for set, broken coils, and distortion. Refer to TB ORD 366 for operating slide spring standards.

d. Operating Slide-spring Guide (fig. 74). Inspect operating slide spring guide for deformation, burrs worn or burred nose, and rust. Shank of guide should be straight. Nose of guide should be free from burrs to insure positive seating in its recess in rear face of operating slide. With spring assembled to guide, insert in housing, or in housing tube in early type receivers, and hand operate to test freedom of movement.

e. Slide Spring Housing (early type receivers). Inspect inside and outside of operating slide spring housing for dents, splits, rust, and foreign matter. Inspect spring retainer for looseness in tube and positioning lug on retainer for burrs and wear. Some tubes have a pressed out lug on the side and a slot in the rear. This lug seats in the operating slide dismounting slot in the receiver (limited design), and the rear slot mates with a small projecting lug in the rear end of the housing tube bed groove in the receiver. The lug should not be bent or burred, and the edges of slot should be clean. If lug is damaged or missing, replace the tube with a new one.

Note. Do not use these early type receivers in rebuild.

40. Repair and Rebuild (Field or Depot Maintenance)

a. In the early type receiver which contains the operating slide spring tube, if the retainer in the rear end of the tube becomes loose, tighten it by crimping tube in with cold chisel. If too loose to be easily tightened, replace the housing assembly. Repair and rebuild of the operating slide assembly consists of replacing worn, damaged parts and elimination of burrs, etc.

b. It is advisable to drill a 3/16-inch hole through the rear end of the receiver into the operating slide spring hole for the purpose of having good circulation of phosphating solution and preservative compounds.

41. Assembly

Refer to FM 23-7 for instructions on the assembly of the operating slide assembly.

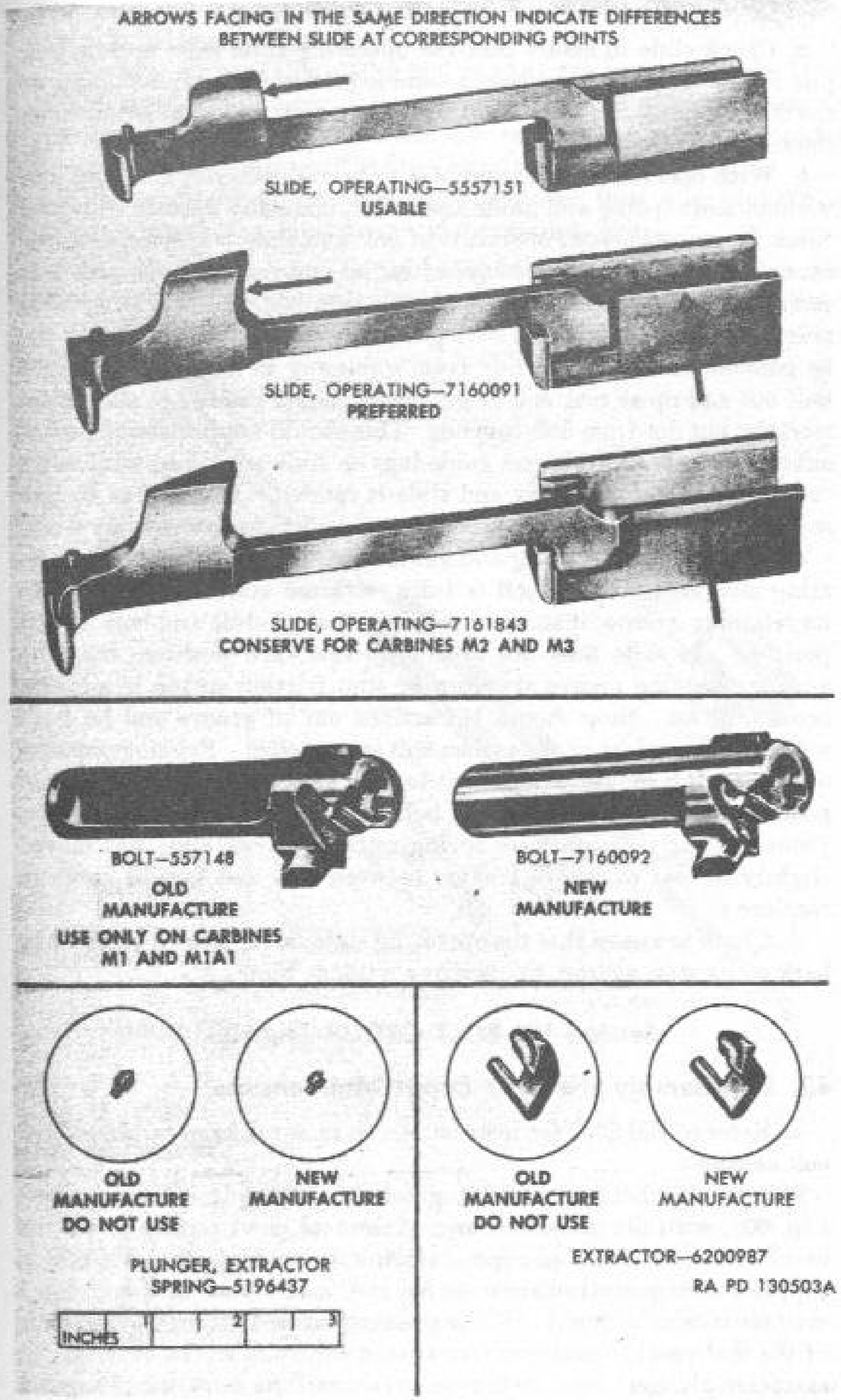


Figure 58. Slide, bolt; extractor, and plunger.

42. Functional Check

a. Check slide to assure that the operating slide stop, spring, and pin (slide 5557151) have been assembled. Check the functioning of the stop by hand to assure that the spring exerts sufficient pressure on the stop to retain it firmly.

b. With operating slide assembled to barrel, receiver, and bolt, and without slide spring and guide assembled, manually operate slide and check for smoothness of operation of bolt and slide. Inspect slide for excessive looseness in guideways of barrel and receiver. Inspect bolt camming recess for retention with bolt cam lug, and operating slide rear guide lug for retention with guideway in receiver. It should not be possible to disengage slide from guideway in receiver. A slight pull out and up at rear end of guideway should disengage slide from receiver, but not from bolt cam lug. This should not be possible, without undue force, until barrel guide lugs on slide are alined with relief cut in left barrel guideway and slide is rotated. If slide can be disengaged otherwise, rear bar is bent or guide lugs are excessively worn.

c. With operating spring and guide installed, test function of operating slide stop. When bolt is fully retracted and stop pressed into its retaining groove, it should positively "hang" slide and bolt in that position. If slide does not remain in rearward position, the stop and/or retaining groove are worn or stop friction spring is missing, broken, or set. Stop should be cammed out of groove and lie flush with bottom surface of slide when bolt is retracted. Friction pressure of stop spring should be sufficient to hold stop positively in retracted position notwithstanding jar of bolt at end of rearward movement. (Stops of early design were spring retracted when slide was moved slightly to rear to relieve friction between stop and face of notch in receiver.)

d. Check to assure that the operating slide can be drawn all the way back to its stop against the receiver without binding.

Section VI. BOLT GROUP (fig. 59)

43. Disassembly (Field or Depot Maintenance)

a. Refer to FM 23-7 for instructions on removal from carbine of the bolt assembly.

b. Assemble bolt disassembling tool 7313298 (fig. 6) to the bolt (fig. 60), with the unslotted tang of the tool pawl resting under the bevel of the extractor plunger. (Bolt disassembling tool 7313298 is supplied to organizational personnel and to ordnance field and depot maintenance personnel.) While pressing down on the unslotted tang of the tool pawl to make certain that it stays under the bevel of the extractor plunger, turn the thumb screw until the extractor plunger is

depressed making it possible to remove the extractor by forcing it out through the hole in the tool.

Caution: If the tang of the tool pawl is not kept under the bevel of the extractor plunger, it will come in contact with the straight portion of the plunger shaft and continued pressure of the thumb screw will cause the tang of the tool pawl to snap.

c. Remove tool slowly keeping finger over tang and plunger to keep plunger from popping out and disassemble bolt.

Note. Any effort to "punch out" the extractor without depressing the extractor plunger will shear off the plunger or the extractor retaining lip. The plunger must be depressed before the plunger is "punched out."

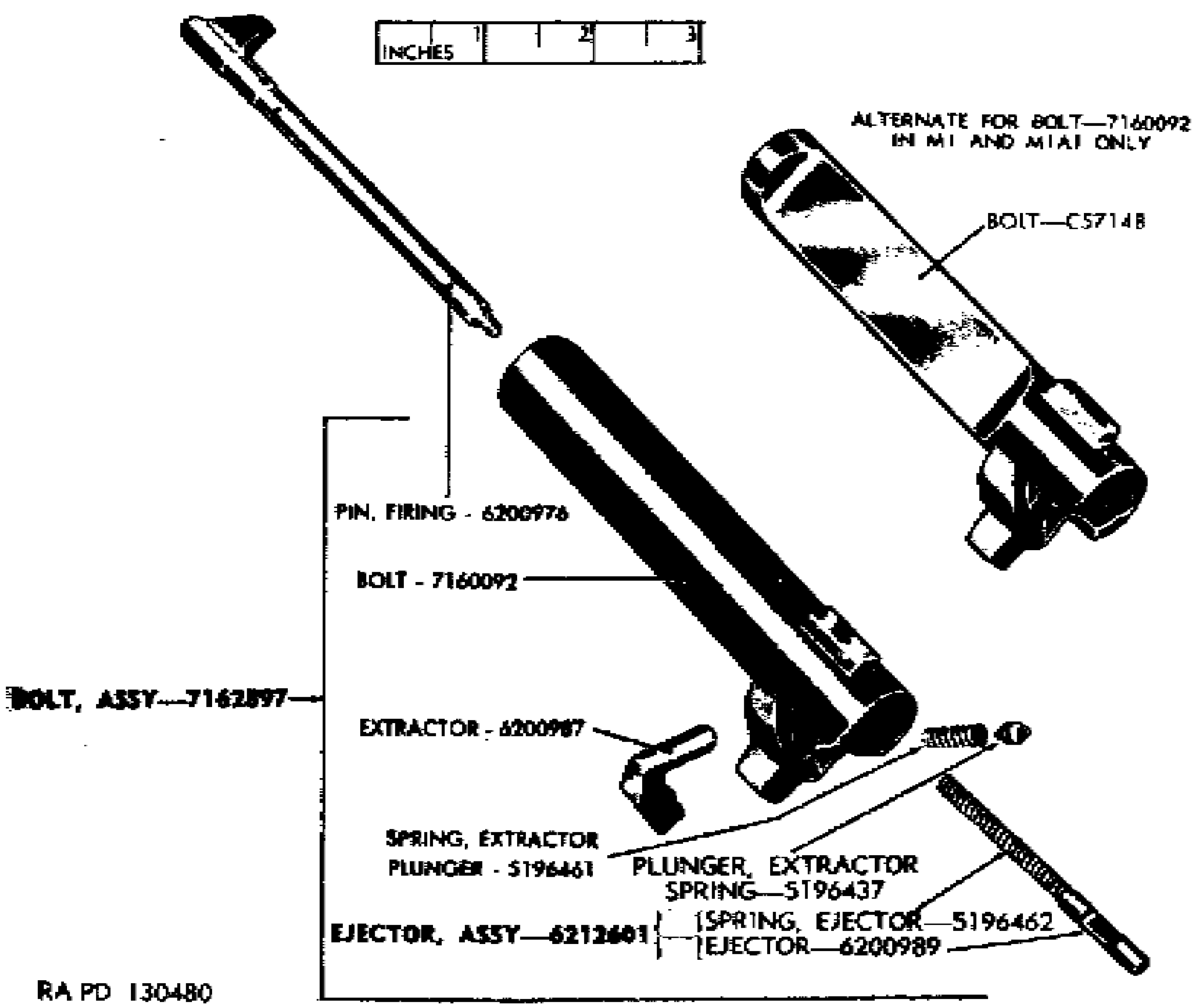


Figure 59. Bolt assembly.

44. Inspection

a. Inspect bolt for cracks (under "black light" in depot maintenance), paying particular attention to the area around the right hand locking lug. Bolts having cracks must be rejected.

b. Check to assure that bolt is free from burrs and excessive wear especially around the hammer cam at the rear. Bolts with badly galled or noticeably worn cams must be rejected. Inspect firing pin tang slot for wear and burrs.

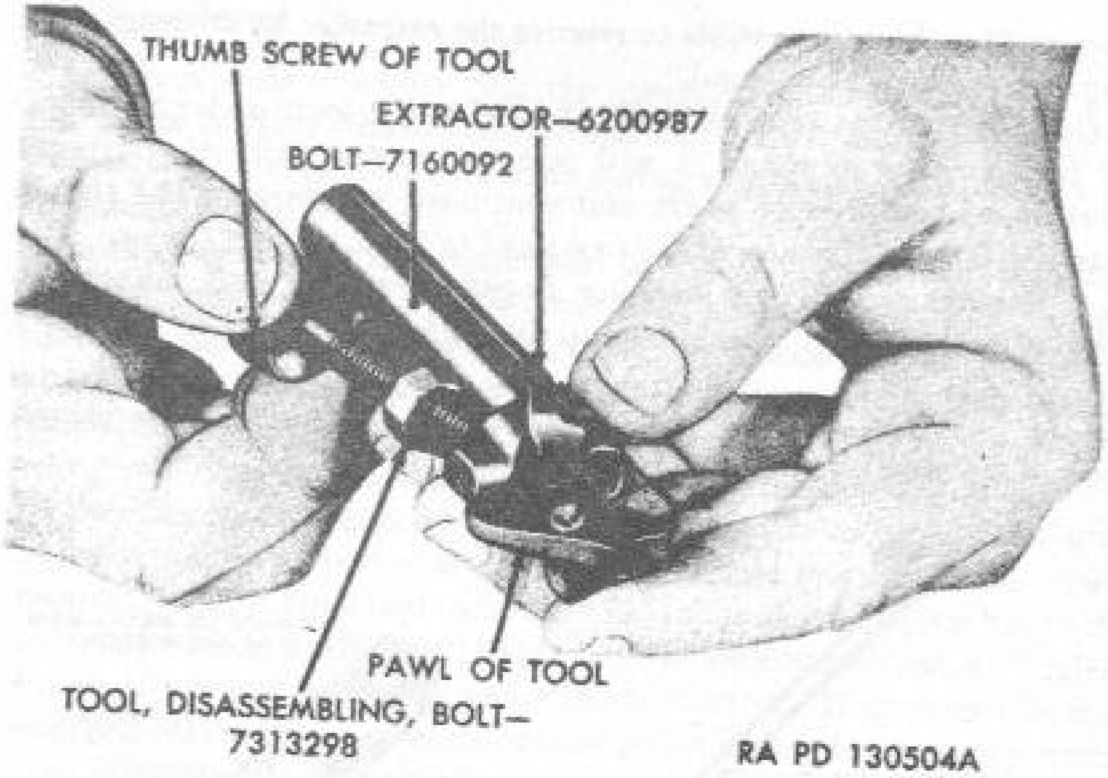


Figure 60. Disassembling bolt.

c. Inspect the firing pinhole at face of bolt. The corner should be free from burrs, but not rounded or chamfered.

d. Visually inspect to assure that there are no burred edges at the two cams on the operating lug.

e. Replace and dispose of all used extractor plunger springs during rebuild.

f. Extractors, with "V" type retaining notch or modified retaining notch, will be replaced and disposed of during rebuild. Use only new type plungers as shown in figure 58 and only previously unused plungers and plunger springs.

g. Visually inspect the ejector assembly for worn, deformed, or broken spring and for condition of ejector. Function test ejector (par. 46).

h. Check to assure that only the new type or modified type firing pin (fig. 61) is used. The old type pins can be modified by depot maintenance if the quantity involved warrants the work required to accomplish this (fig. 62). Function test bolt and firing pin (par. 46).

i. Check to assure that only full round bolts 7160092 are used in the carbines M2 and M3 (fig. 58). Bolt 557148 will be used in carbines M1 and M1A1 in so far as practicable in order to conserve supply of bolt 7160092 for use in the carbines M2 and M3.

j. Visually inspect to assure sufficient firing pin protrusion and proper contour of firing pin point. (The firing pin protrusion should not be less than 0.048 inch DEPOT MAINTENANCE ONLY.)

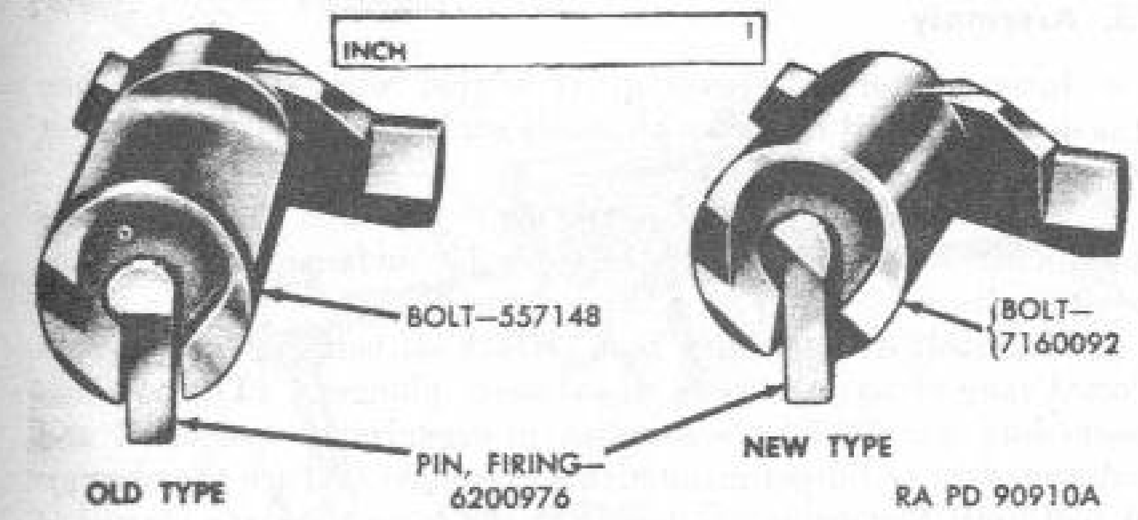


Figure 61. Bolt and firing pin.

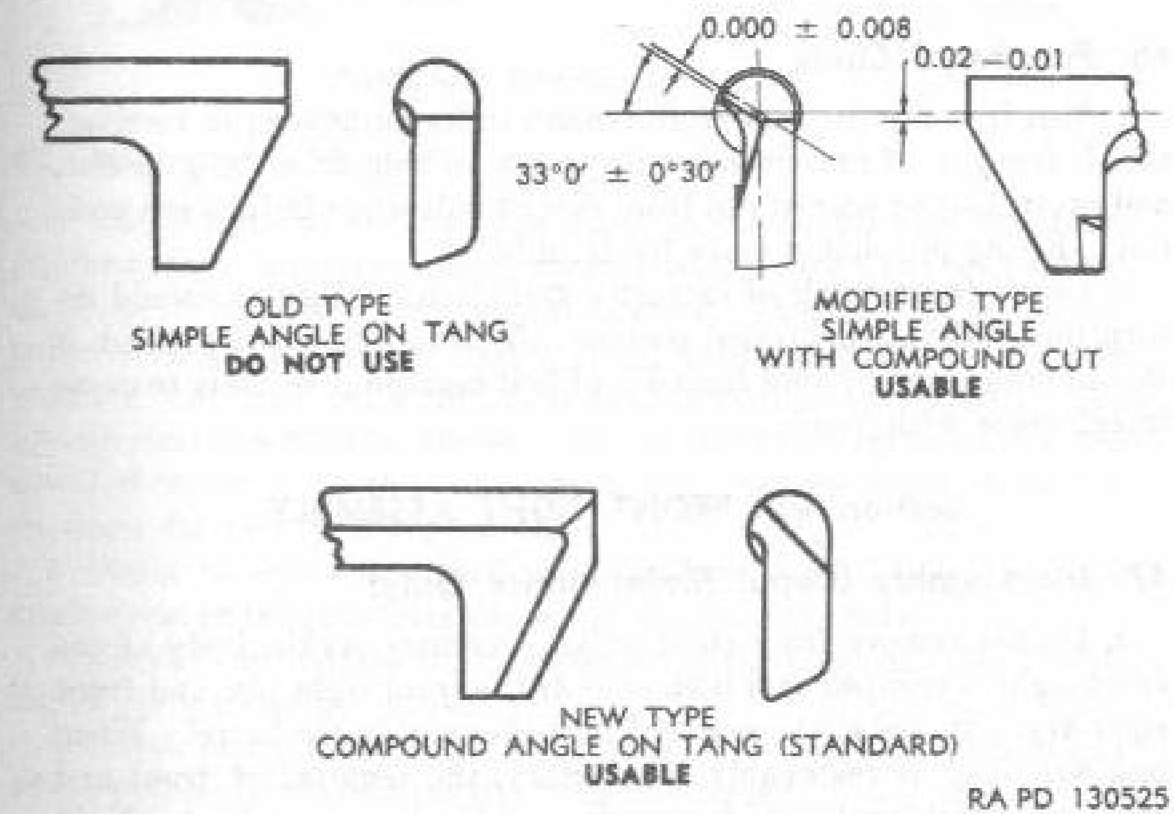


Figure 62. Firing pin 6200976.

k. Check assembled bolt to insure that extractor shank does not protrude beyond body of bolt.

l. Repair and rebuild of the bolt group consists of replacing worn or damaged parts. Bolt faces and other parts subjected to burned powder residues must be thoroughly cleaned. Scrub these parts with a bristle brush moistened with rifle-bore cleaner.

45. Assembly

a. Insert ejector and ejector spring so that recess in ejector, when it is depressed, will line up with inside surface of the bolt to permit complete entry of the extractor.

b. Insert extractor spring and plunger. Position the plunger so that its flat-surface will match the inner flat surface of the extractor retaining lip.

c. Place bolt disassembling tool 7313298 on bolt (fig. 60) so that slotted tang of its pawl rests on extractor plunger. (The bolt disassembling tool 7313298 is supplied to organization personnel and ordnance field and depot maintenance personnel.) Turn thumbscrew of tool until plunger is depressed; at the same time, the ejector is depressed into bolt by the tool.

d. Insert firing pin and extractor and remove tool.

46. Functional Check

a. Test bolt for freedom of movement in its guideways in receiver. Check freedom of movement of firing pin in bolt, fit of tang in slot, and protrusion of nose of pin from face of bolt when in forward position. Firing pin should move freely in bolt.

b. Check functioning of extractor and ejector. Ejector should return forcibly from depressed position. When ejector is depressed, it should not extend beyond front lip of bolt because it is likely to cause interference with feeding.

Section VII. FRONT SIGHT ASSEMBLY

47. Disassembly (Depot Maintenance Only)

a. Do not remove front sight unless necessary, as the body of the front sight is crimped over both ends of the front sight pin, and front sight key is staked at the rear end in its keyway in the barrel. When original finish is reasonably satisfactory, the removal of front and rear sights and front band to permit sand blasting, in order to obtain the highest quality protective finish, is not required.

b. Remove the front sight as follows:

(1) With the barrel and receiver in a padded vise, the muzzle protruding about 1 inch beyond the jaws of the vise, and the front sight vertical, drive out front sight pin from left to right, using a 3/32-inch drift.

(2) Position front sight removing tool 7161237 (fig. 7) over front sight, hooking it on the rear of the sight (fig. 63).

(3) Enter pilot of tool screw into end of barrel and remove from sight by turning handle of tool.

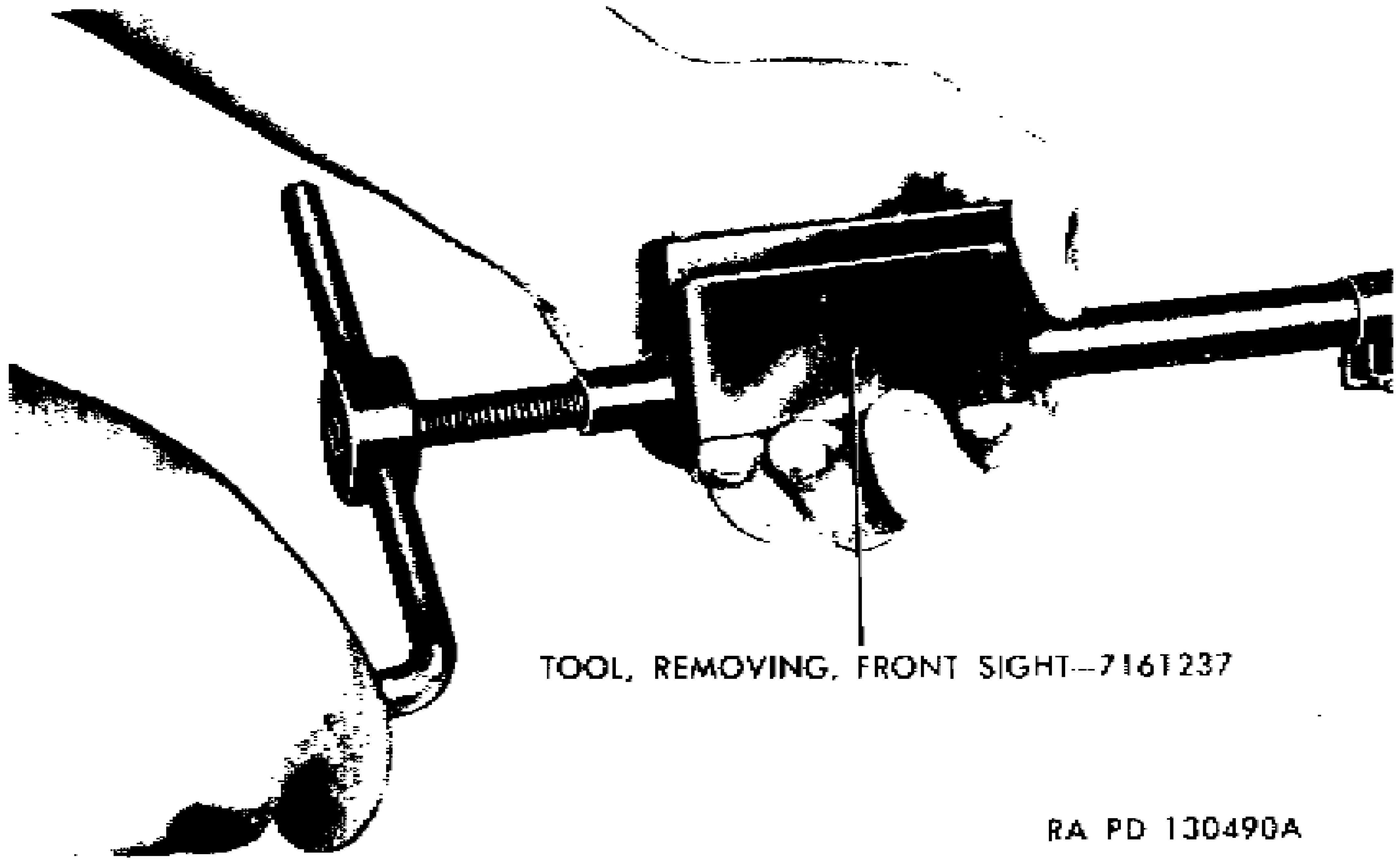


Figure 63. Removing front sight.

48. Inspection

a. Check sight to see that it is tight on the barrel and free from malformation and burrs, and to assure that the barrel has been staked at the rear end of the front sight keyway. In any staking at this point, caution must be exercised to avoid distortion of the base. It is required that the front sight be tapped forward on the barrel to take up any clearance between the key, keyway, pin, and sight and that the metal of the barrel at the end of the keyway be upset against the key to secure the sight in this position.

b. Check to assure that staking of the front sight keyway and the application of the proofmark have not distorted the bore.

c. Check to assure that the ring portion of the front band surrounds the barrel with spring tension.

d. Check crimping of front sight; it must be crimped at each end of the pinhole to prevent the pin from coming out.

e. Inspect wings; any deformation due to installation of sight on barrel or otherwise is cause for rejection.

f. Check height of blade; it must be not less than 0.140 inch, measured from the base of the blade. This is necessary for a good sight picture. In actual practice, it has been found necessary to maintain a height of approximately 0.315 inch in order to target by bore sighting. Sights, not conforming to this 0.315-inch dimension, will be retained for reworking.

g. The height of the blade is adjusted by depot maintenance so that the carbine will meet the targeting requirements defined in paragraph 25*c*. This is done by filing down the blade. The blade contains sufficient stock to adjust height during targeting.

h. Inspect the top of blade; it must be square and coated with Magic Blue (or similar substance) to prevent gloss and preserve the surface.

49. Repair and Rebuild

Looseness of the front sight on the barrel is usually caused by a loose key which is inadequately staked. The key can be tightened by tapping it forward against the front end of the keyway and then staking the rear end of the keyway firmly against the rear end of the key. Care must be taken not to distort the base. If the key has side movement, replace the key or, field maintenance may peen the key lightly if a new key is not available.

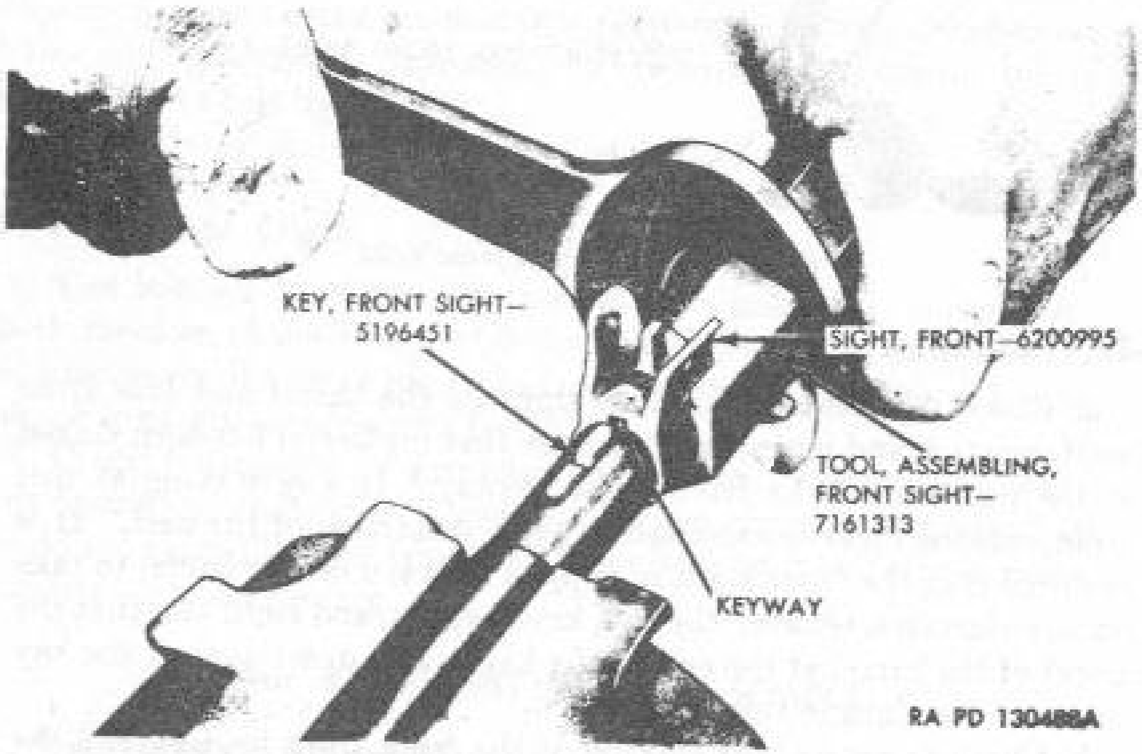


Figure 64. Aiming front sight.

50. Assembly

Caution: The front band must be assembled on the barrel before the front sight is assembled.

Place front sight key in keyway in top of barrel at muzzle with pin notch facing up. Tap key snugly toward front end of keyway and stake metal of sight over both ends of pin to hold it in position. Slide front sight on barrel with sloping faces of wings to rear. Using front sight assembling tool 7161313 (fig. 7) mate keyway and key in barrel (fig. 64) and drive sight on barrel (fig. 65) until pinhole in sights is in alinement with pin notch in key. Install front sight pin and stake metal of sight over both ends of pin to hold it in position. Drive sight forward and stake barrel against rear end of key.

Note. If practicable, the front sight will be kept mated with the barrel and receiver assembly from which it was removed.

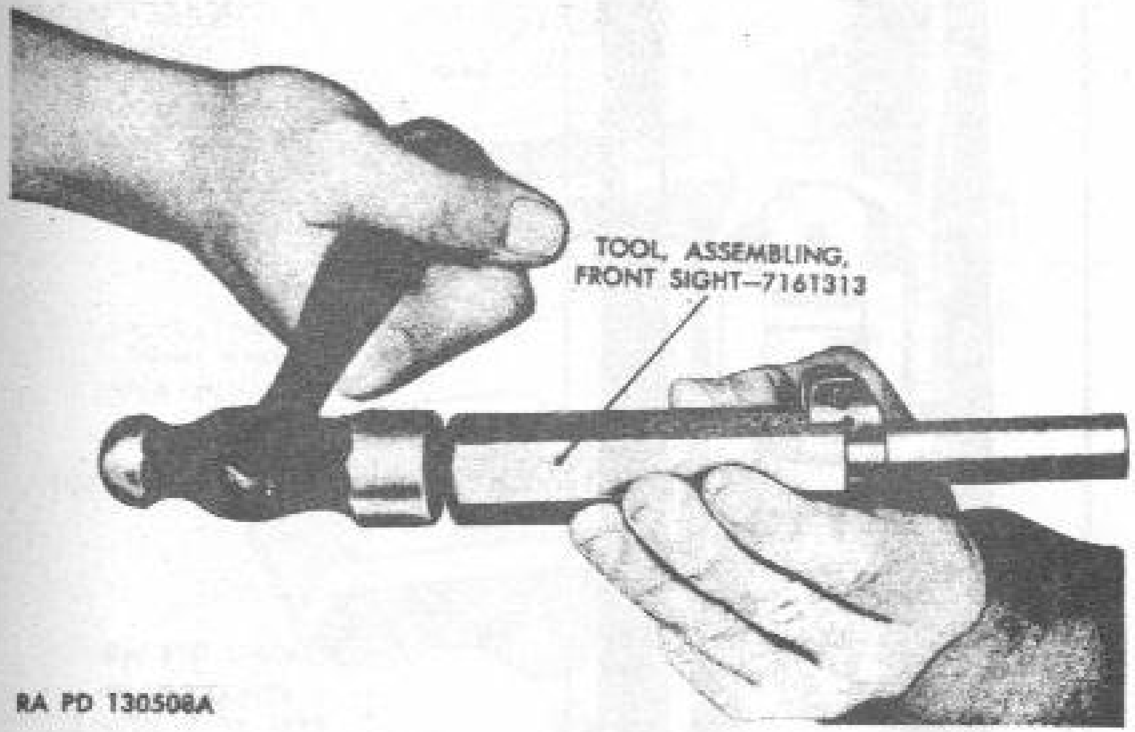


Figure 65. Installing front sight.

Section VIII. REAR SIGHT ASSEMBLY

51. General

Carbines of early manufacture were equipped with an "L" type (leaf type) rear sight (fig. 66) composed of two integral leaves set at right angles to each other. By Modification Work Order ORD B28–W3 this sight is replaced by the adjustable rear sight. All carbines of later manufacture are equipped with adjustable rear sight 6573955 or 7160060 (fig. 67), which differ only in method of manufacture. Sight 6573955 is a machined type, and sight 7160060 is a stamped type. The function and operation of both sights are identical.

52. Disassembly (Field Maintenance)

a. Scribe a mark on the receiver directly opposite line on sight base for sight assembly 6573955 (machined type) and in the receiver directly opposite mark on zero sight plate for sight assembly 7160060 (stamped type). This is necessary for proper alinement in assembly.

b. Place adjustable rear sight assembling tool 7312068 (fig. 8) on the receiver with the lip of the tool riding on the operating slide guideway in the receiver. If the sight is of the stamped type, insert spacer (fig. 69) (hanging at end of chain on tool) in place to prevent distortion of sight base wings. With the right hand jack screw retracted to the extreme position and out of the way, slide the tool over the sight (fig. 68).

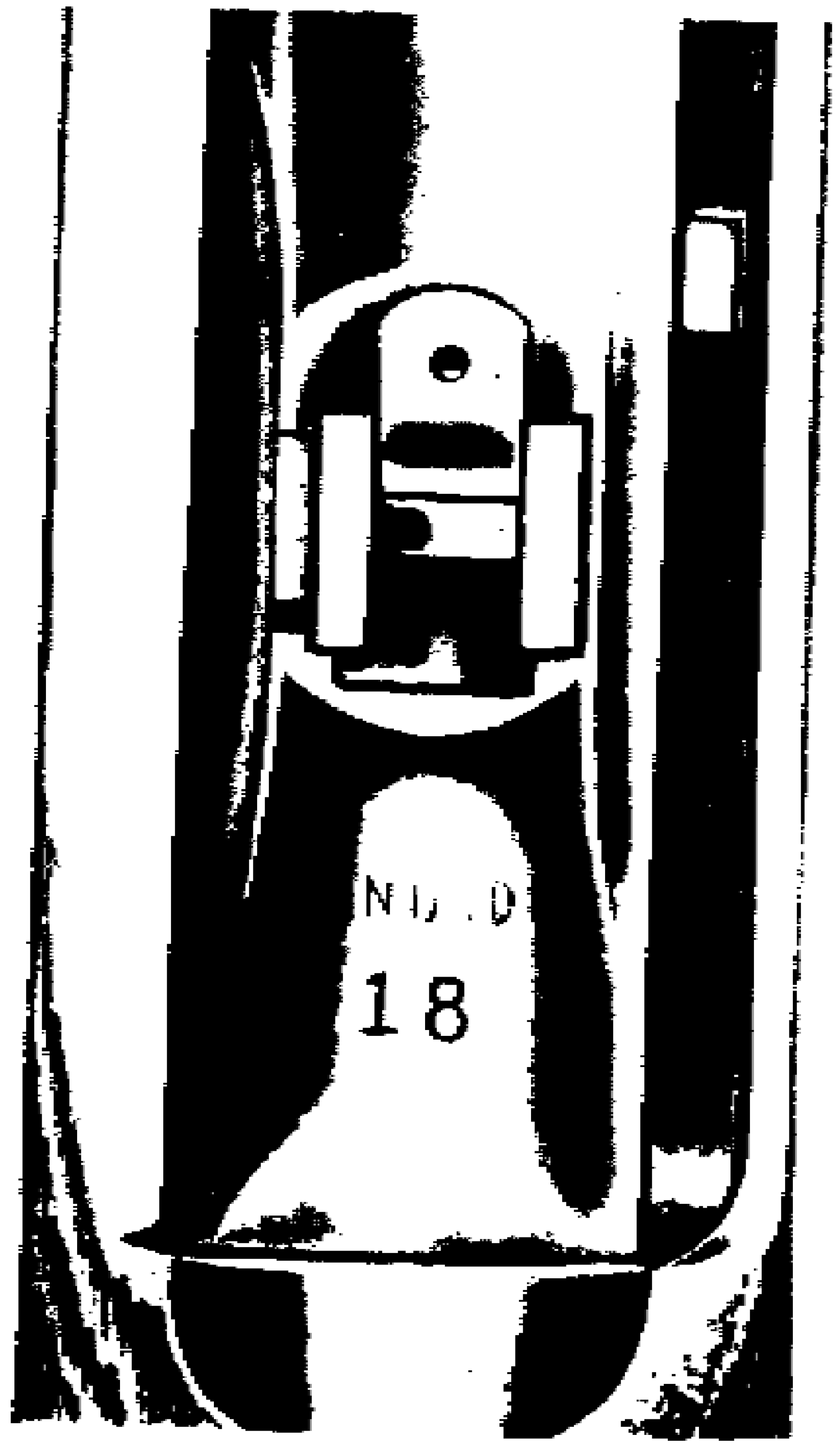


Figure 66. L-type (leaf type) rear sight assembly.

c. Push guide of tool (sliding member to which chain is attached), so that inside end rests on side wing of sight base, fit recess of connector over outside end of guide and tighten left hand jack screw. As pressure is applied, tap connector with a brass hammer and take up slack with jack screw until sight is removed.

53. Inspection

a. Check sight base for looseness and sides of base will not be bent or distorted; damage of this nature may be caused by assembling and disassembling. Check ramp for worn or burred guideways and index ball retention notches on the floor of the sight ramp.

b. Check windage screw for wear of threads, burrs, security and staking, and check windage screw knob for worn knurling. The windage knob must be free enough for hand operation, move with distinct clicks, and retain its setting. It should be possible to move the ramp to extreme limit on either side without objectionable binding. With ramp centered in sight base, press windage knob to left and release to test spring action of index ball on knob. There should be merely lateral movement of the knob due to pressure and index spring

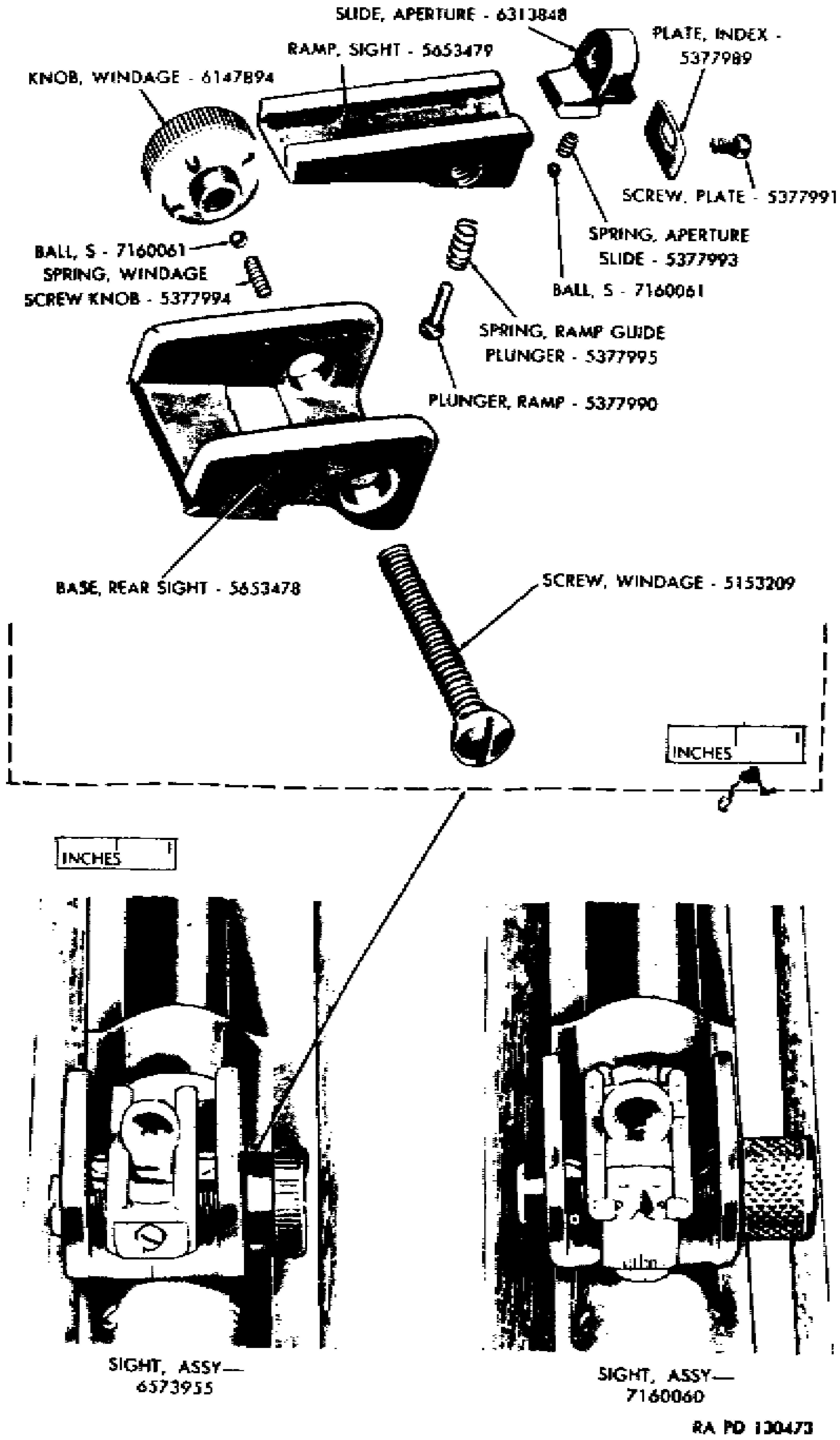


Figure 67. Adjustable rear sight assembly for M1, M1A1, M2 carbines.

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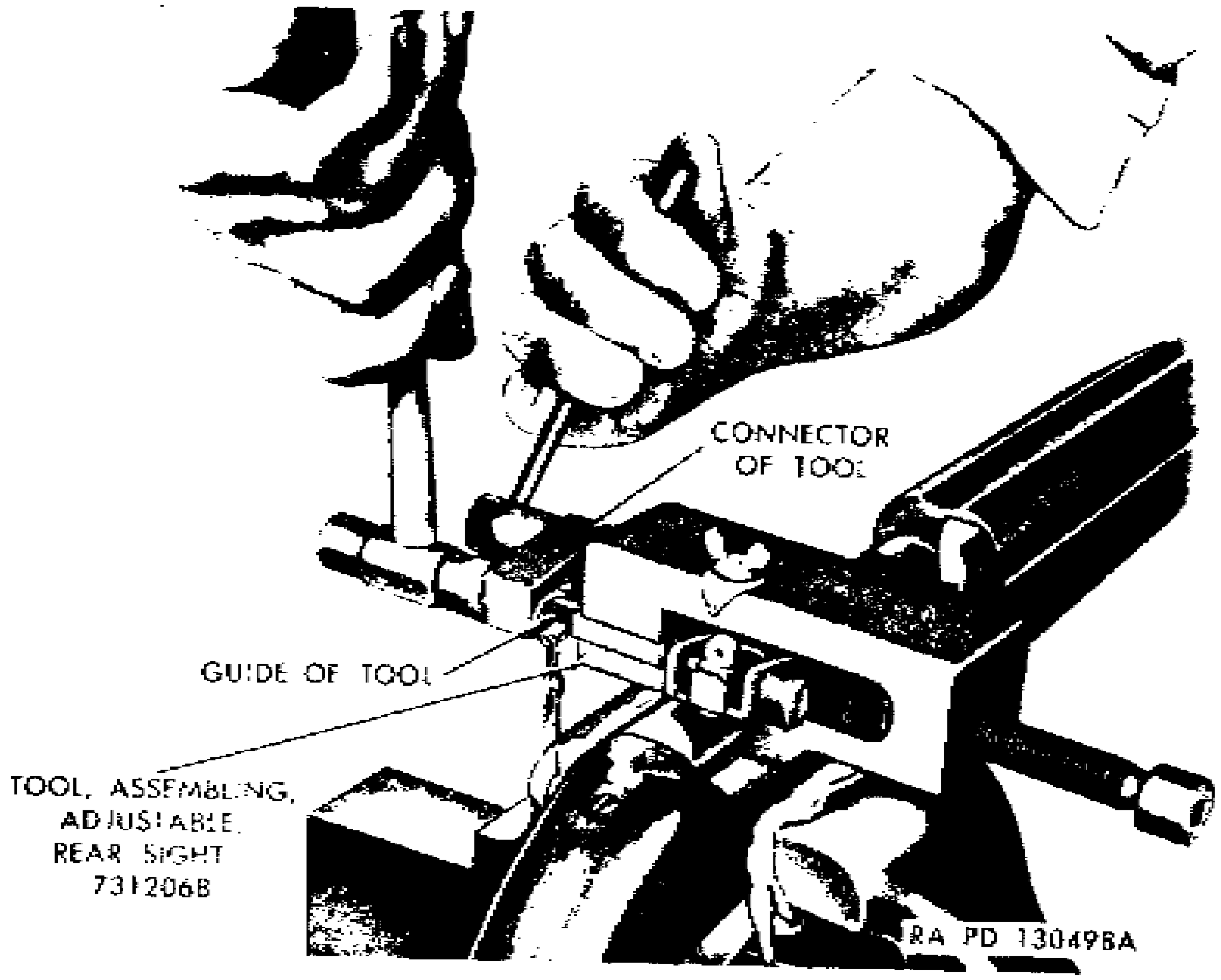


Figure 68. Removing adjustable rear sight.

action. When released, there should be clearance between inner face of knob and sight base.

c. With ramp centered in sight base, attempt to move lower end of ramp from side to side. There should be practically no lateral movement. If movement is present, it indicates worn threads on either windage screw, ramp, or both. Press rear end of ramp down and release to check spring action of ramp guide plunger.

d. Move aperture slide up and down full length of ramp. Slide should move freely but with distinct clicks and be positively retained at each sight setting. The slide should be stopped at the front (lower) end of the ramp and at the rear (top). There should be no undue looseness of the aperture slide in the ramp guideways. Inspect peep hole for absence of shine and foreign matter.

e. On the stamped type sight, the index plate should be so positioned that the index line is in the approximate center of the base. (In other words, the index plate must not be rotated to one side or the other on its pivot because the full range of adjustment of the plate is intended for the user of the weapon.) The rivet should be tight enough to retain the plate firmly in its set position.

f. On the machined type sight, the index plate should be positioned approximately in the center of the ramp and the screw must be tight enough to retain the plate firmly in that position.

g. After targeting (DEPOT MAINTENANCE ONLY) and adjustment of the rear sight on the receiver, check to assure that the overhang of the rear sight base does not exceed the following limits:

(1) The right-hand side of the sight base should not be pushed to the left beyond the point where it is flush with the side of the dovetail on the receiver.

(2) The sight should be pushed onto the receiver far enough so that the left-hand side of the base is flush or beyond the left-hand side of the dovetail on the receiver.

h. After targeting, check to assure that the receiver is staked to retain the rear sight firmly in place.

54. Repair and Rebuild

a. Repair. As the adjustable rear sight is replaceable only as an assembly, no replacement spare parts are furnished for field repair. Check machined type sight for loose or missing index plate and screw. The sight should be kept clean and lightly oiled to prevent rusting and insure proper operation.

b. Refinishing. To remove corrosion from the rear sight assembly without removing it from the barrel and receiver assembly, proceed as follows:

(1) Sand blast the adjustable rear sight assembly, when necessary, using fine grit and a controlled air pressure.

(2) Blow accumulated grit and dust from the assembly with compressed air having a moisture filter.

(3) Phosphate finish the assembly.

(4) After finishing, thoroughly rinse, dry, and oil the assembly with water displacing oil.

(5) Test rear sight ramp to determine that it traverses completely to left and right without binding.

(6) Test aperture and it must move freely up and down the ramp under normal finger pressure.

c. Cleaning. The sight is cleaned best with a small brush and clean cloths. Remove light rust with preservative lubricating oil. Use crocus cloth for removal of heavy rust, but since its use produces shine, exercise caution. When cleaning, move ramp and aperture slide in order to clean thoroughly under them.

d. Oiling. Immediately after cleaning, apply a light film of preservative lubricating oil to all exposed metal surfaces to prevent rusting. Excess oil will collect foreign matter, which will clog the sight and cause excessive wear. A small drop of oil on index balls and ramp guide plunger will lubricate and preserve these parts and their component springs. Such oiling is best done with the dropper of the oiler, or a broom straw dipped in oil. Wipe off excess oil.

Note. When cleaning the carbine, apply a small drop of oil to the aperture slide guideways in the ramp, the threads of the windage screw, the index balls, and ramp guide plunger. Use preservative lubricating oil (medium) above +32° F. and in humid climates, and preservative lubricating oil (special) below +32° F.

e. Loose Sight Base. If the sight base becomes loose in the receiver, tighten it by restaking the receiver into either of the two notches in the dovetail base of the sight. If base has shifted, it should be realined and restaked. If sight has been staked properly, it can be restaked in the same place. If necessary to restake at other than the previous points of stacking, file new indents in sight base and stake receiver opposite the new indents. Make certain that points of staking are one-sixteenth of an inch from edges of dovetail slot and directly opposite the indents. If staking fixture does not line up with indents in sight base, perform staking free-handed as outlined above.

55. Assembly (Field Maintenance)

a. Press new rear sight into right side of dovetail by hand.

b. Center the aperture ramp on the sight base.

c. If stamped type sight is being placed on receiver, place spacer attached to assembling tool 7312068 in place for reinforcing the side wings of sight (fig. 69).

d. Place assembling tool on receiver with lip of assembling tool engaging operating slide guideway in receiver.

e. Move assembling tool to rear until dovetail guide (sliding member) on tool will enter dovetail slot in receiver.

f. Tighten right jack screw by hand until block of jack screw is against the side of sight.

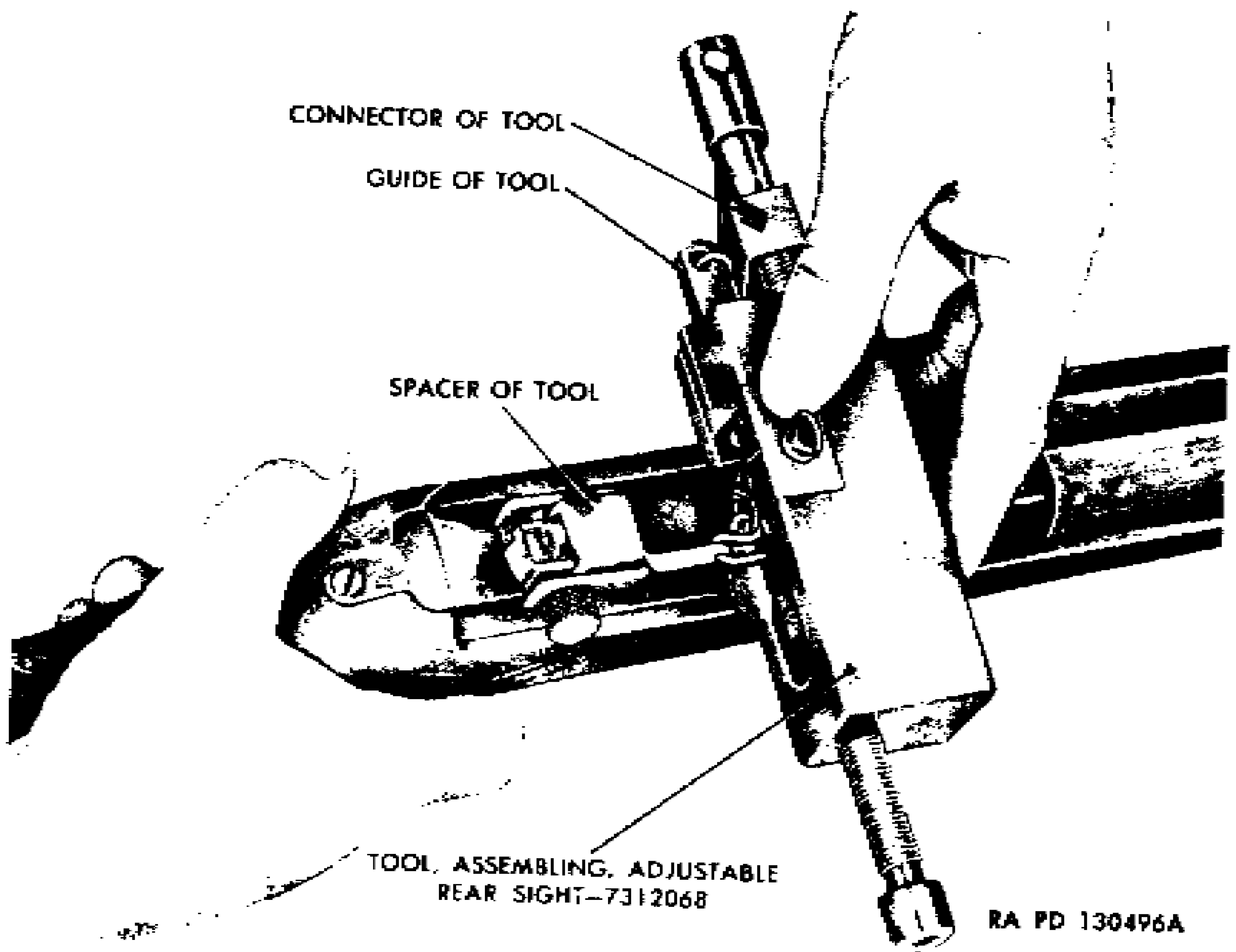


Figure 69. Rear sight assembling tool with spacer.

g. Insert torque wrench 41–W–3628–85 (fig. 8), and move the sight into the dovetail slot (fig. 70). Wrench should show an applied torque reading of between 18 and 54 inch-pounds. If the reading is not within the above limits, remove sight and proceed as follows:

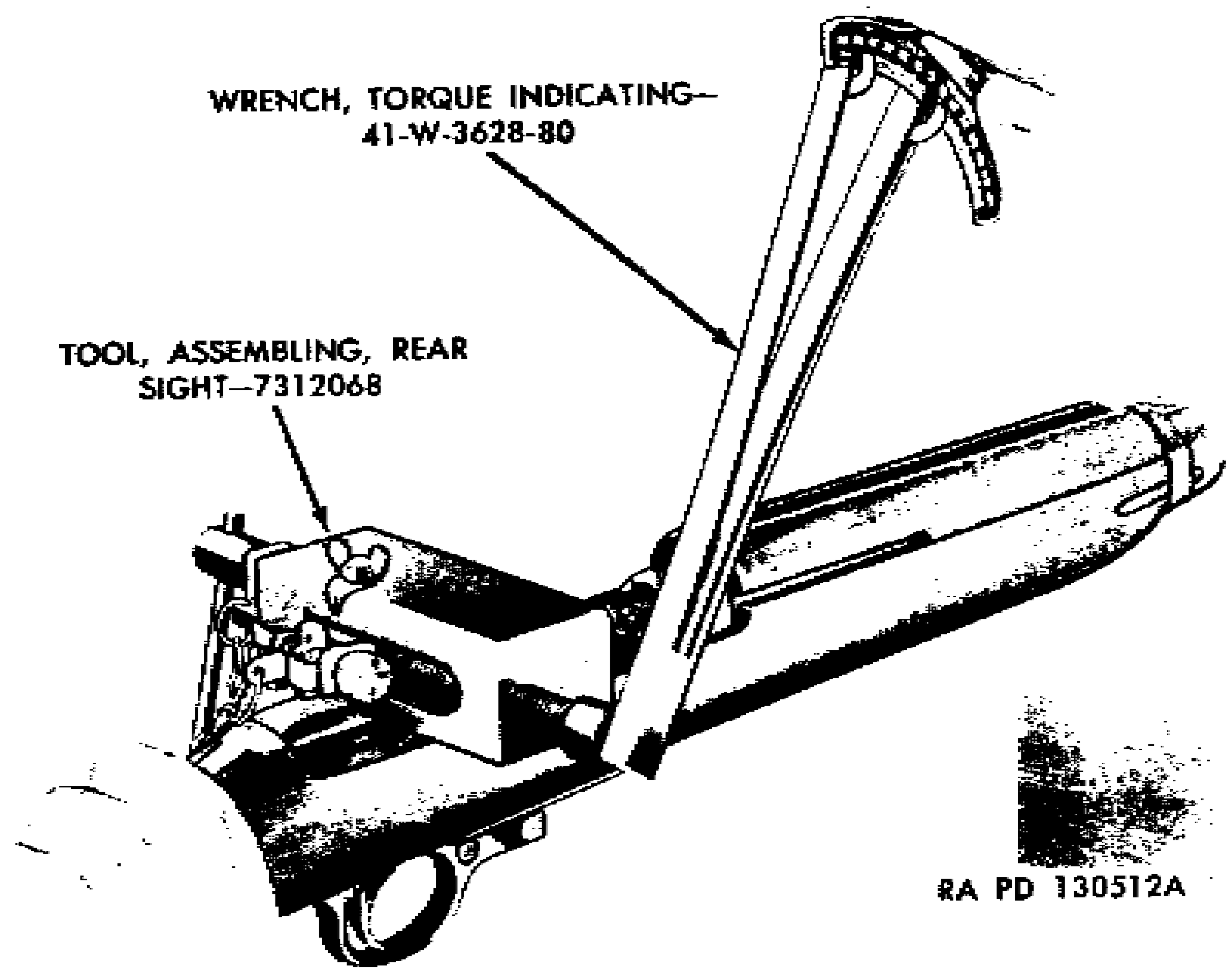


Figure 70. Moving rear sight in place with torque wrench.

(1) If reading is below 18 inch-pounds indent the area in front of the dovetail slot. This can first be done by using punch 7312234 (fig. 73) and rapping punch with a hammer. Undertake this operation with extreme caution. A blow only hard enough to cause a flow of metal into the dovetail slot is necessary.

(2) If reading is above 54 inch-pounds, file the bottom of the sight base as shown in figure 72. Do not attempt to file the edges of the sight base and under no circumstances should the receiver be filed.

Caution: Reading on torque wrench should be taken during movement of the wrench, as reading taken when starting the wrench will be high, due to starting torque in moving jack screw. Exercise great care during the procedure outlined in *g* above, as the dovetail base

of the sight is hardened as well as the dovetail slot in the receiver. Because of this, it is necessary that the load limits as prescribed and as indicated on the torque wrench, be rigidly maintained. If too great a pressure is exerted in the placement of the sight, the receiver of the carbine will crack or break; and if too light a pressure is exerted, the sight will work loose under the shock of firing.

h. Continue operation above until zero line on sight base (machined type sight) or zero sight plate (stamped type sight) is alined with scribe mark on rear of receiver.

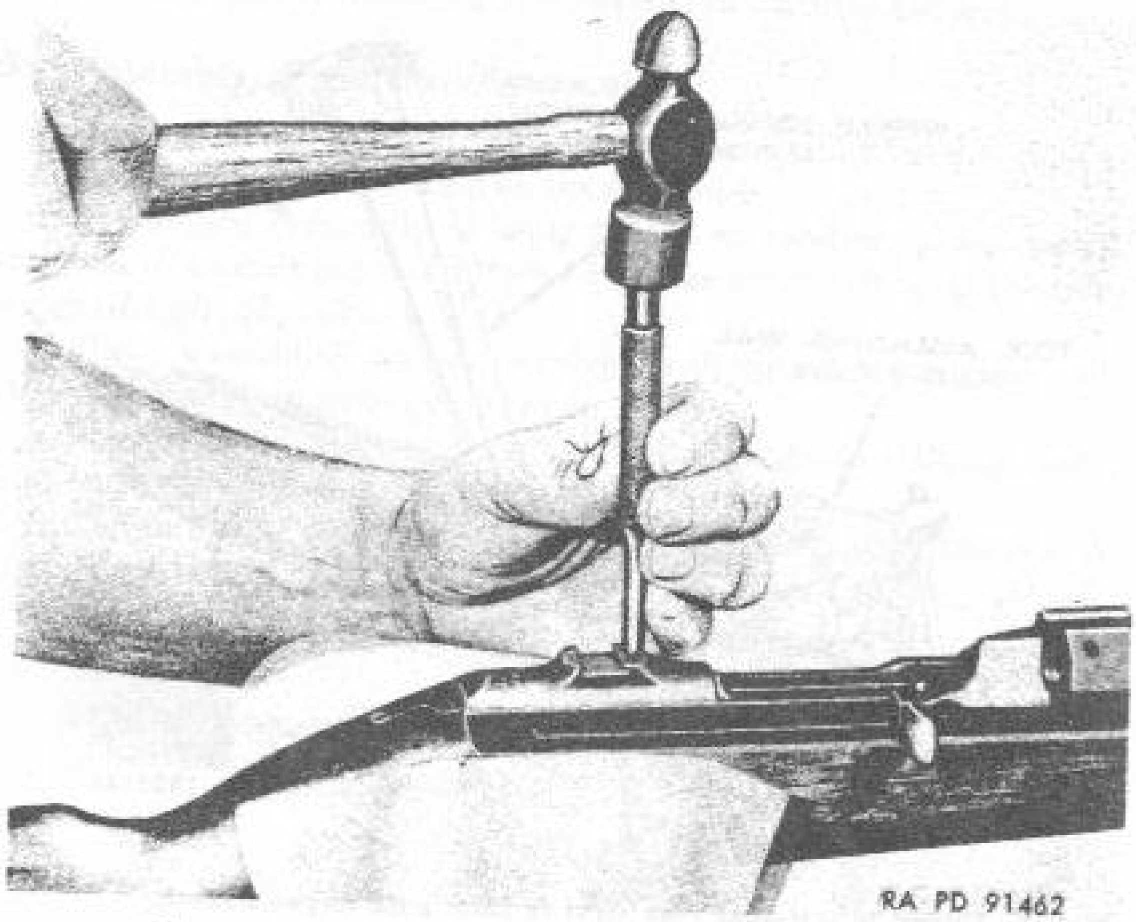


Figure 71. Peening receiver to reduce oversize dovetail slot.

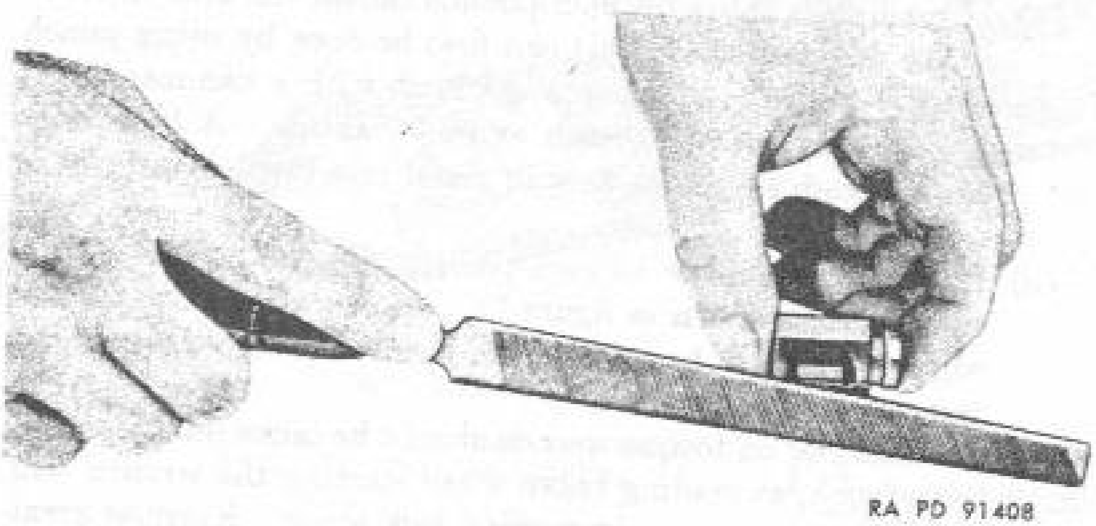


Figure 72. Filing rear sight base to fit undersize dovetail slot.

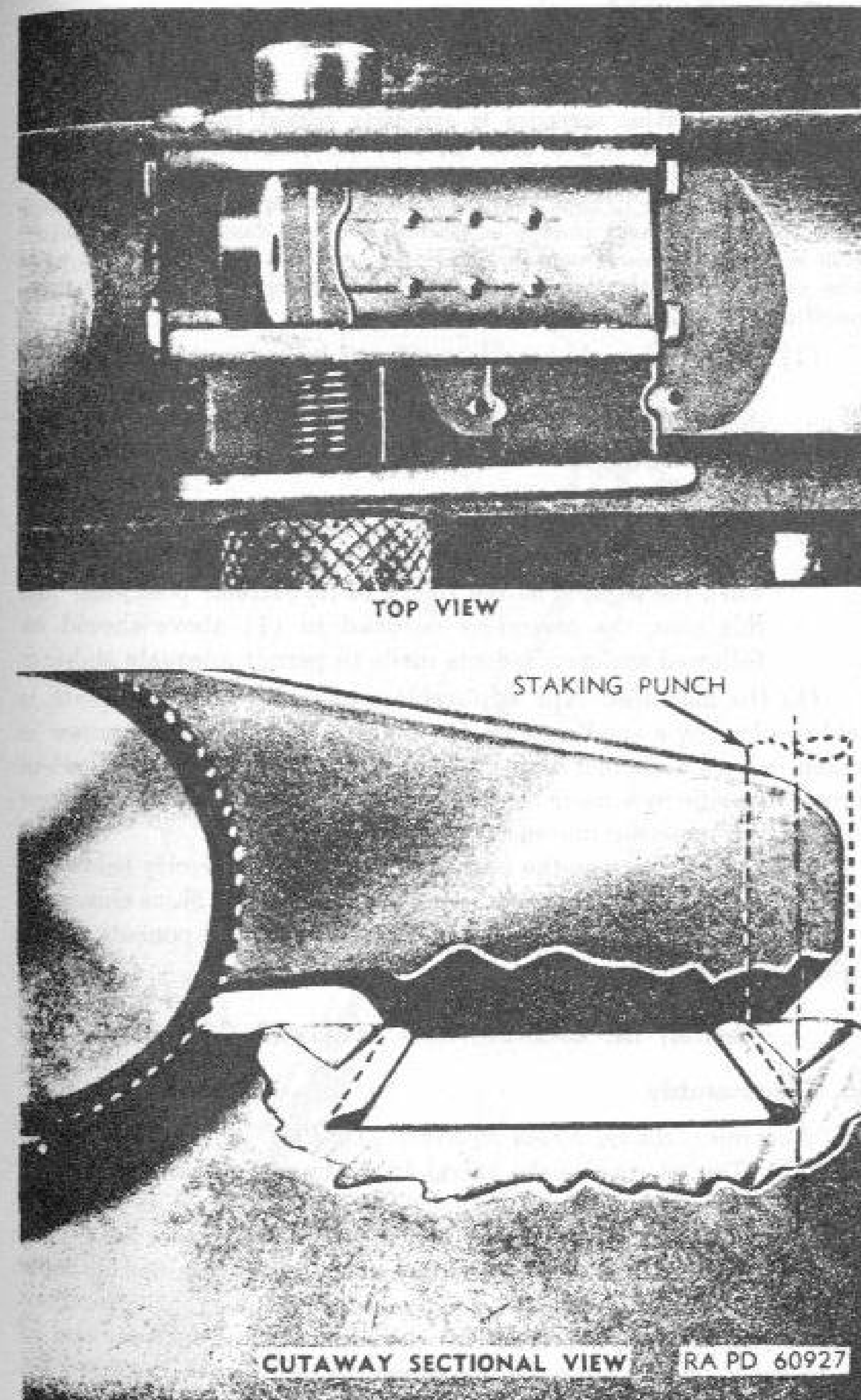


Figure 73. Rear sight showing staking.

i. Remove the tool from the receiver.

j. Screw ramp of sight to extreme left.

k. Stake rear sight in place.

Note. The staking operation is extremely critical and success of this operation will depend largely upon the skill and judgment of the operator. Study carefully the illustrations regarding the proper type of staking operation (fig. 73). Bear in mind that the sharp upper edges of the dovetail slot on the receiver are easily chipped or cracked, and such damage will ultimately result in an unserviceable weapon. Many problems will arise which will have to be solved by the individual mechanic; a few of these problems and their remedies are listed in (1) and (2) below.

(1) Indents on sight base dovetail may be horizontally misalined with references to holes in sight base. If the indents are slightly out of horizontal alinement they may be corrected by enlarging the indents very slightly with a small three-square file.

(2) Sometimes sufficient material is not available on the receiver to permit an adequate staking job. This is particularly true when the sight is moved to one of its extreme positions. In this case, the procedure outlined in (1) above should be followed and new indents made to permit adequate staking.

l. On the machined type adjustable rear sight the index plate is held in place by a small screw. On some of these sights the screw is staked in such a manner as to prevent its removal. Take care, when zeroing the rifle by a movement of the index plate, to loosen the screw only enough to permit movement of the index plate.

m. The index plate on the stamped type sight is directly below the ramp and in the center rear portion of the sight base. Move this plate with a small drift to prevent damage to any of the components of the sight and weapon.

Section IX. BARREL AND RECEIVER GROUP

56. Disassembly

a. Removing Barrel From Receiver (*DEPOT MAINTENANCE ONLY*). Do not remove the barrel from the receiver except for replacement of a new barrel. Replace barrel if it is bent or damaged if the chamber is worn to the extent of effecting excessive headspace (par. 15*g*) or if it does not meet the requirements specified in table III. Completely disassemble all components from barrel and receiver. Place barrel in jaw protected vise. Allow enough of the rear end of the barrel to project from the vise to permit the wrench 7113308 (fig. 9) to be positioned over front of receiver (fig. 76). Place wrench over receiver near barrel and unscrew counterclockwise.

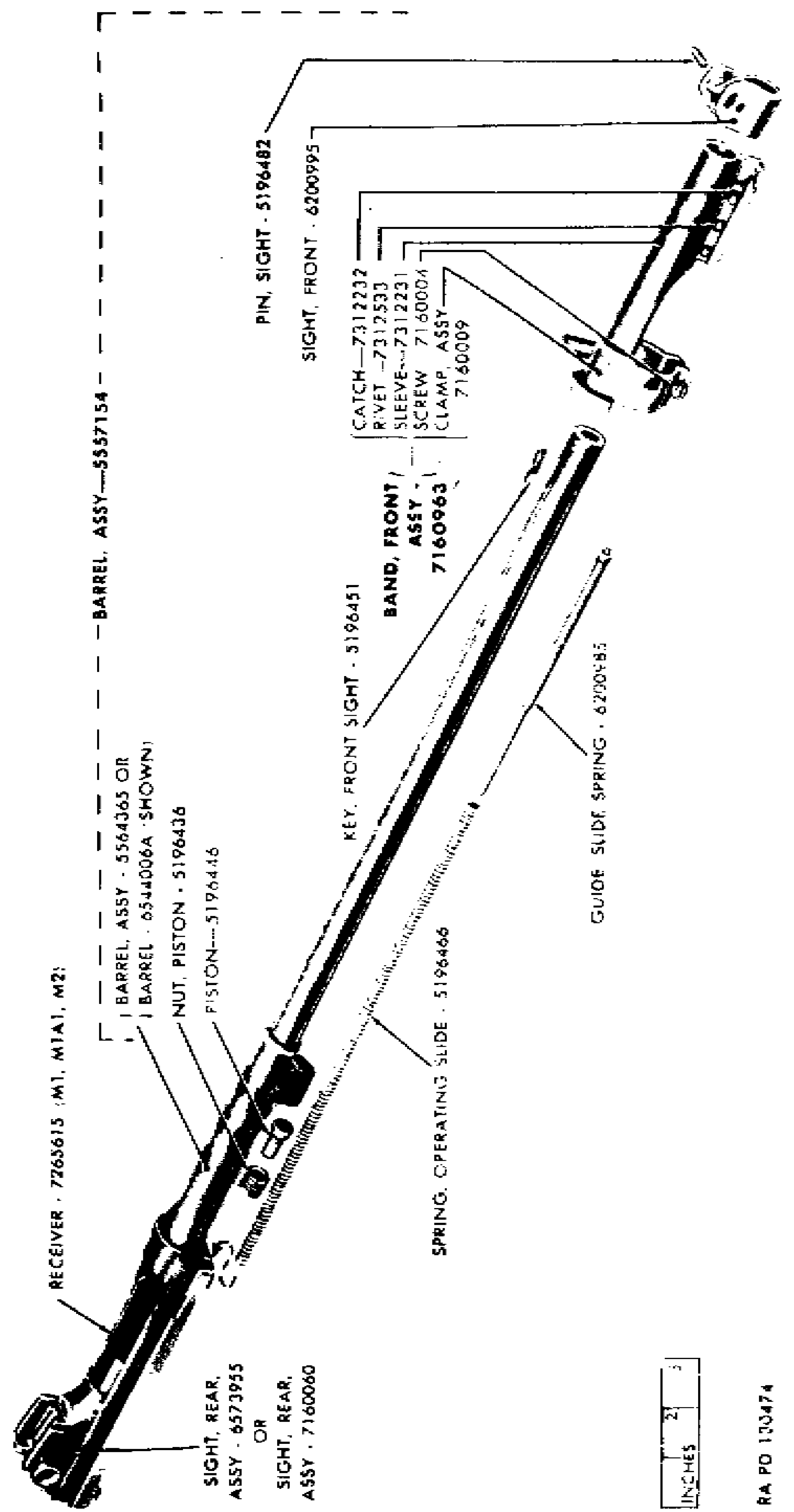


Figure 74. Barrel and receiver group M1, M1A1, M2 carbines.

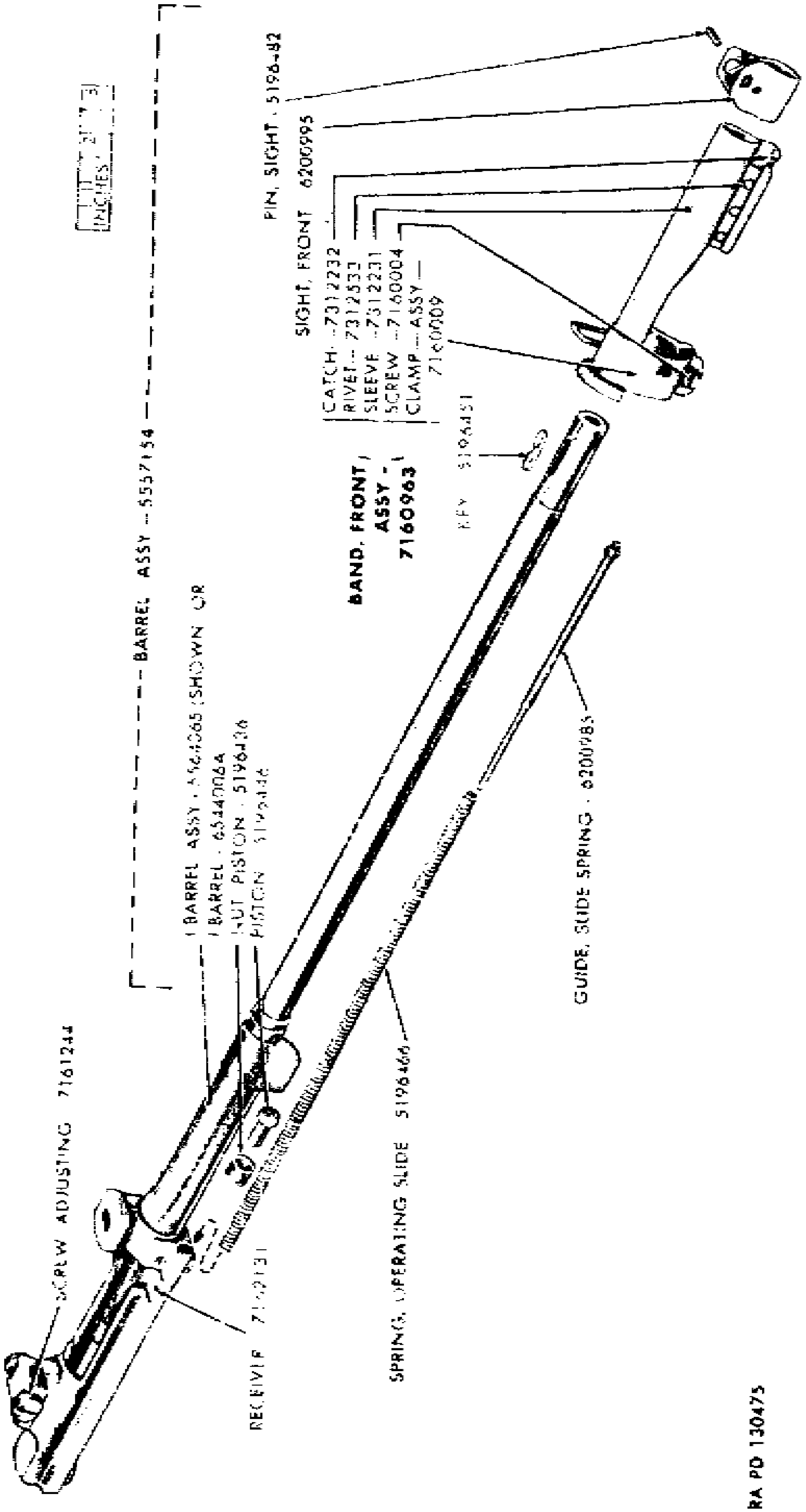


Figure 75. Barrel and receiver group M5 carbine.

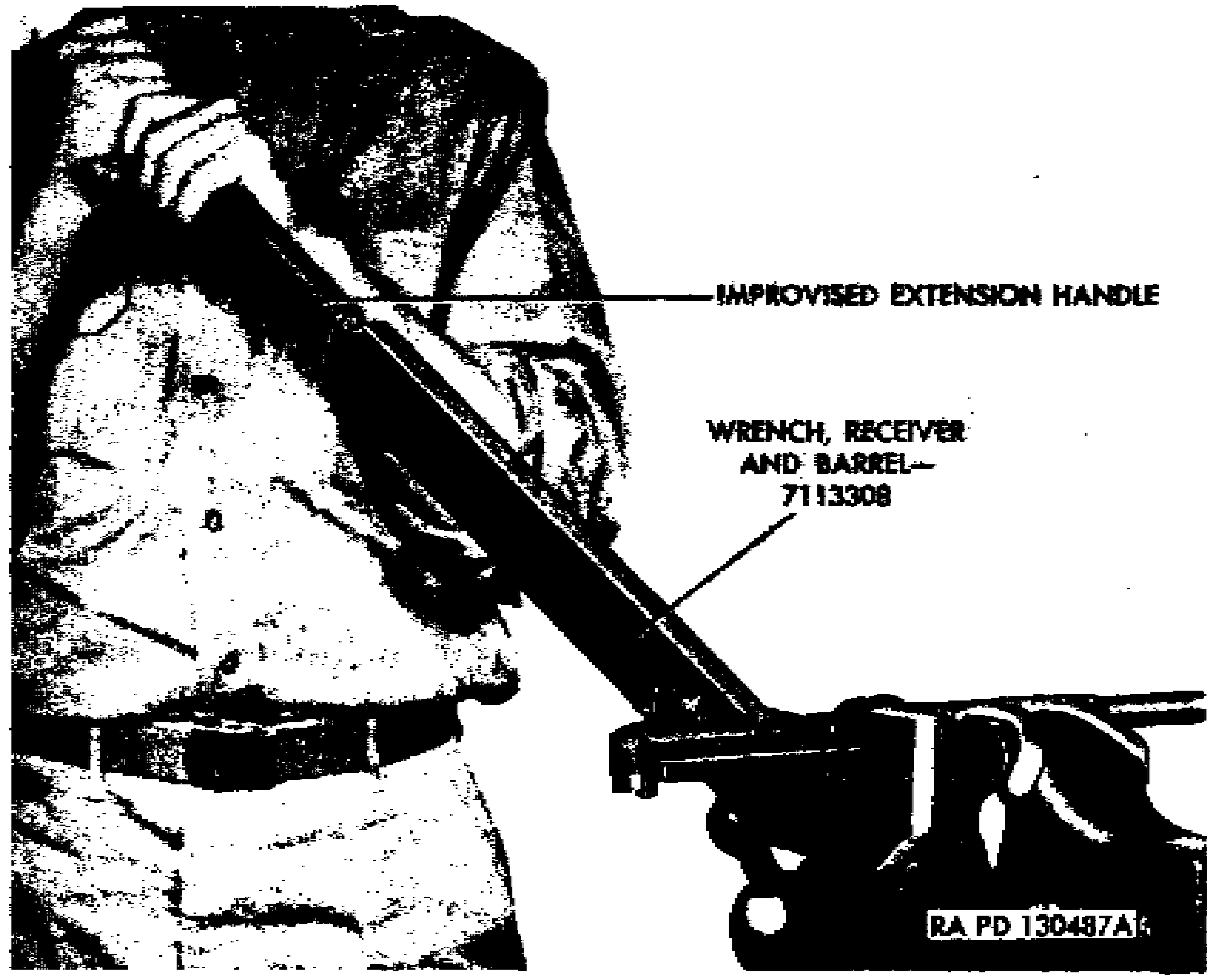


Figure 76. Removing barrel from receiver.

b. Removing Gas Piston and Piston Nut (FIELD OR DEPOT MAINTENANCE).

(1) The gas piston and piston nut are the only removable parts of the gas cylinder group. To remove the piston, clamp the barrel firmly in a vise with protected jaws, and using gas piston nut removing tool M5 5621065 or gas cylinder reconditioning tool 7160995 (fig. 6) (with wrench component), unscrew the piston nut counterclockwise from gas cylinder (fig. 77). Take care not to bur or twist prongs on nut when removing (nut is staked in place) or piston will not move freely. Remove nut, elevate muzzle of barrel, and slide piston out of gas cylinder. If necessary, tap cylinder lightly with a wooden block to slide piston out. If nut does not loosen readily, soak with preservative lubricating oil, special, for about an hour to loosen. Oil can be dropped through gas port drill hole in gas cylinder.

(2) If piston becomes "frozen" in the gas cylinder due to carbon or rust, soak with preservative lubricating oil (special) for about an hour and then work out of cylinder. When the nut and piston are removed, clean gas cylinder and piston thoroughly and oil lightly.

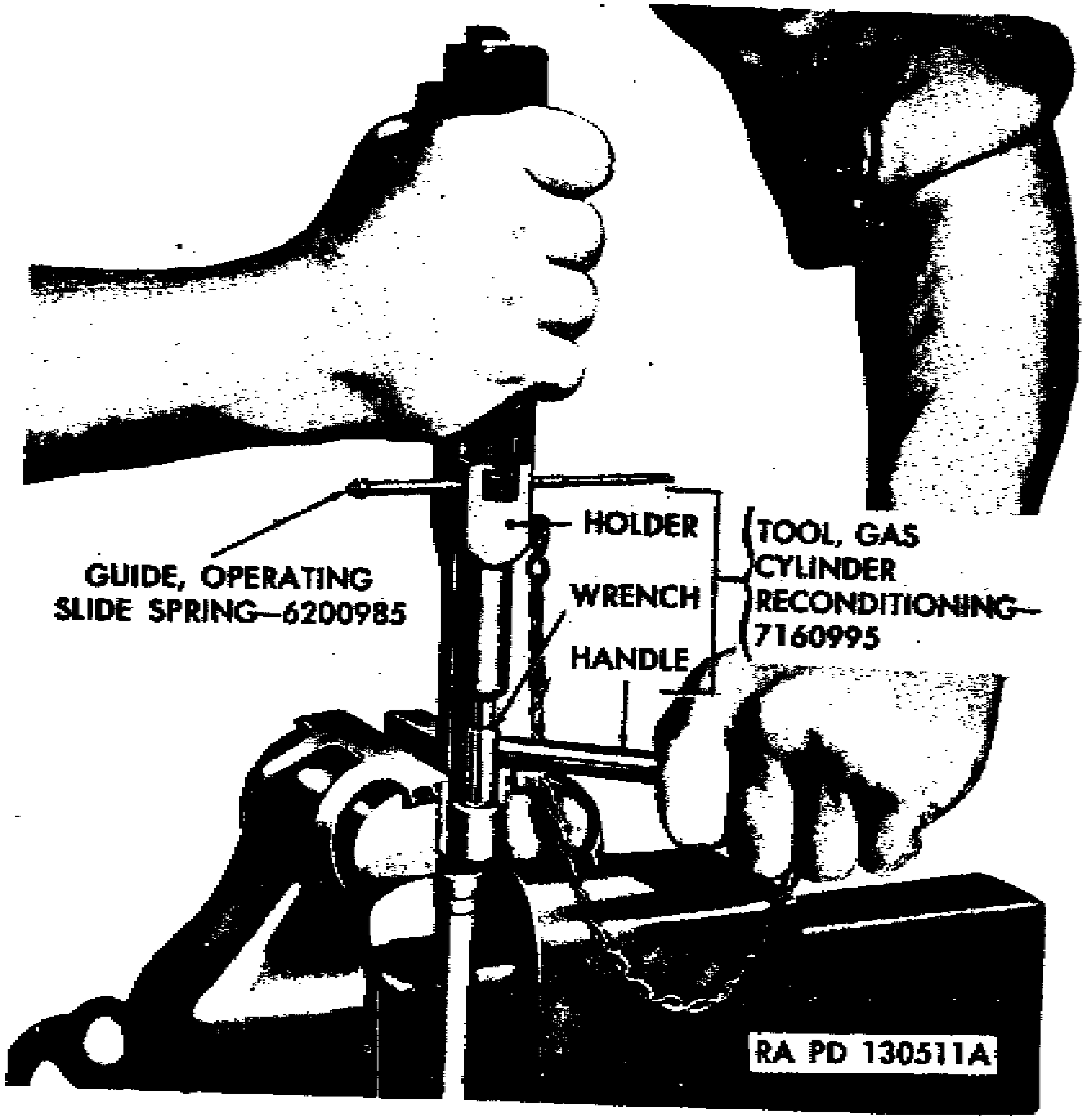


Figure 77. Removing piston nut from gas cylinder.

(3) The gas cylinder may be integral with the barrel, or swaged on the barrel at manufacture. Do not remove the gas cylinder. If gas cylinder is unserviceable, barrel assembly should be replaced (DEPOT MAINTENANCE ONLY).

57. Inspection

a. Receiver (figs. 74 and 75).

(1) Inspect operating slide spring well for rust or foreign matter. Visually inspect receiver for break-through of the operating slide spring hole. This break-through occurred in the original manufacture of some receivers because of the drill running out through either the bottom or right-hand exterior surfaces. If the forward end of the break-through is 3 inches or more from the front end of the receiver, it is acceptable; otherwise, it must be rejected (DEPOT MAINTENANCE ONLY). Any sharp or feather edges around this break-through are to be removed.

(2) Inspect receiver under "black light" (Magnaglo or approved equal) for cracks in the area around the bolt locking slot at the right hand side and at the front and rear trigger housing retaining lugs (DEPOT MAINTENANCE ONLY). Receivers having cracks extending in both directions around a corner must be rejected.

(3) Visually inspect condition of firing pin retracting cam mating cut in the bridge of receiver (fig. 78). This cam was cut to an angle of 33° in the earlier manufacture of receivers and later to 45°. Both are acceptable if in good condition.

(4) Visually inspect trigger housing retaining pinhole in the receiver. If out of-roundness is apparent, reject the receiver (DEPOT MAINTENANCE ONLY).

(5) Inspect the bullet ramp in the receiver to assure it is clean and smooth for proper feeding of the ammunition. Burrs and sharp edges should be removed by careful polishing with fine emery cloth. The lower edge of the bullet ramp (where the angular surface intersects the vertical) should be smoothly rounded.

(6) Inspect receiver for looseness with barrel, deformation, rust and burrs. If receiver is disassembled from barrel, inspect for worn or crossed threads in barrel aperture (DEPOT MAINTENANCE ONLY).

(7) Inspect bolt guideway and locking shoulders for wear, burrs, cracks, and foreign matter. Inspect receiver retaining lug on rear end (figs. 78 and 105) for wear, burrs, and looseness with recoil plate when assembled to stock.

(8) Inspect operating slide guideway on right side for wear, burrs, and foreign matter, and operating slide removal cut for wear and burrs. Inspect operating slide stop detent aperture for wear, burrs, and foreign matter. Forward surface of aperture should be at a sharp right angle to receiver, and with a clean edge to facilitate retention of stop, and rear face smooth and sloping to facilitate camming. Inspect the rear inside face of receiver for foreign matter.

b. Barrel.

(1) *General inspection.* Inspect barrel for deformation, alinement with receiver, and for rust, corrosion, and burrs. Inspect gas port for foreign matter and inspect extractor cut in rear face for burrs and foreign matter. Inspect operating slide guideways for excessive wear, burrs, and foreign matter. Burred or damaged muzzle end causes inaccuracy.

(2) *Inspection for serviceability.*

(*a*) Inspection of barrel for serviceability is based principally upon accuracy, and inspectors are guided by this require-

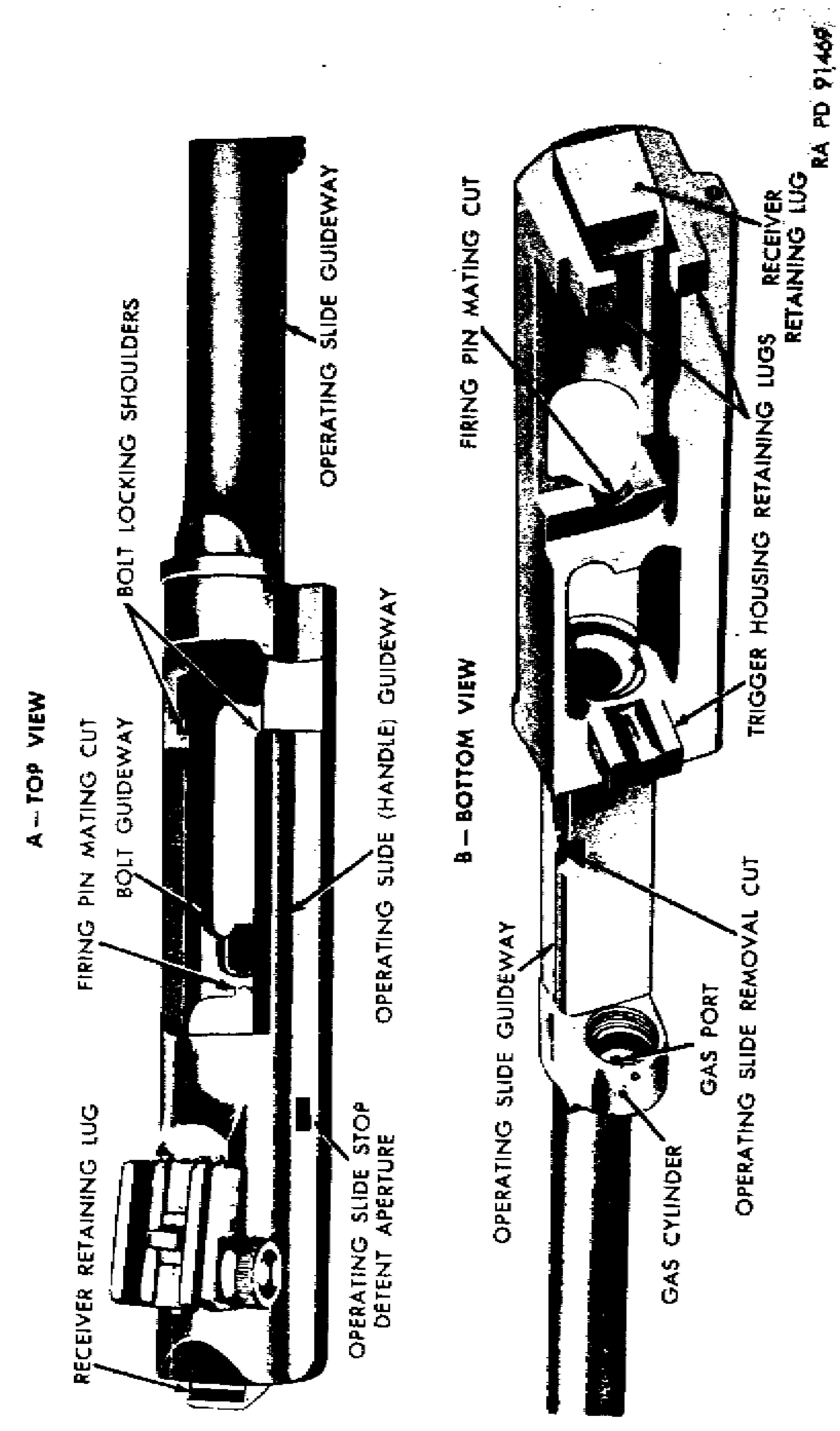


Figure 78. Barrel and receiver group—points of inspection.

ment. Accuracy is reduced in varying degrees by the following defects: bulges, erosion, and pits (table III). Before a barrel is inspected for serviceability, fouling and oil should be removed and the bore wiped dry.

(*b*) Place barrel reflector in the chamber and examine the bore from the muzzle and breech. If no barrel reflector is available, place a piece of white paper or rag in receiver and hold barrel so that light is reflected into chamber and bore.

(*c*) If the bore contains small pits but has sharp and uniformly distinct lands, is free from bulges, and is not otherwise deformed, it is serviceable.

(*d*) If the barrel contains a bulge, it is unserviceable. This condition is indicated by a dark ring in the bore and may often be noticed through a bulge or raised ring on the barrel surface.

(*e*) If the barrel is pitted to such an extent that the sharpness of the lands is affected, or if it has a pit (or pits) which extends the width of a land or groove and is three-eighths inch long or longer, the barrel must be rejected.

(*f*) During the inspection of the bore from the breech, give special attention to the chamber. Pits will cause hard extraction and may cause the cartridge case to stick in the chamber sufficiently to cause failure to extract. Barrels with chambers having pits large enough to cause cartridges to stick are unserviceable.

(*g*) All rebuilt carbines must be counterbored at the muzzle end of the barrel (fig. 79). This counterbore improves the accuracy of the carbine and is intended to eliminate tool marks, nicks, and burrs in the muzzle end of the barrel (par. 58*f*).

(*h*) Barrels of current manufacture have been modified by the elimination of a portion of the skirt (fig. 80) on the chamber end. In barrels of early manufacture, this skirt was extended around approximately two-thirds of the chamber end of the barrel and was thickened somewhat in its center section. As the thin section of the skirt served no useful purpose, it was eliminated and only the thickened portion remained. When looking into the breech end of the gun only the thickened portion remained. When looking into the breech end of the gun ahead of the bullet ramp, the thread of the receiver can be seen (fig. 81). This is a normal condition.

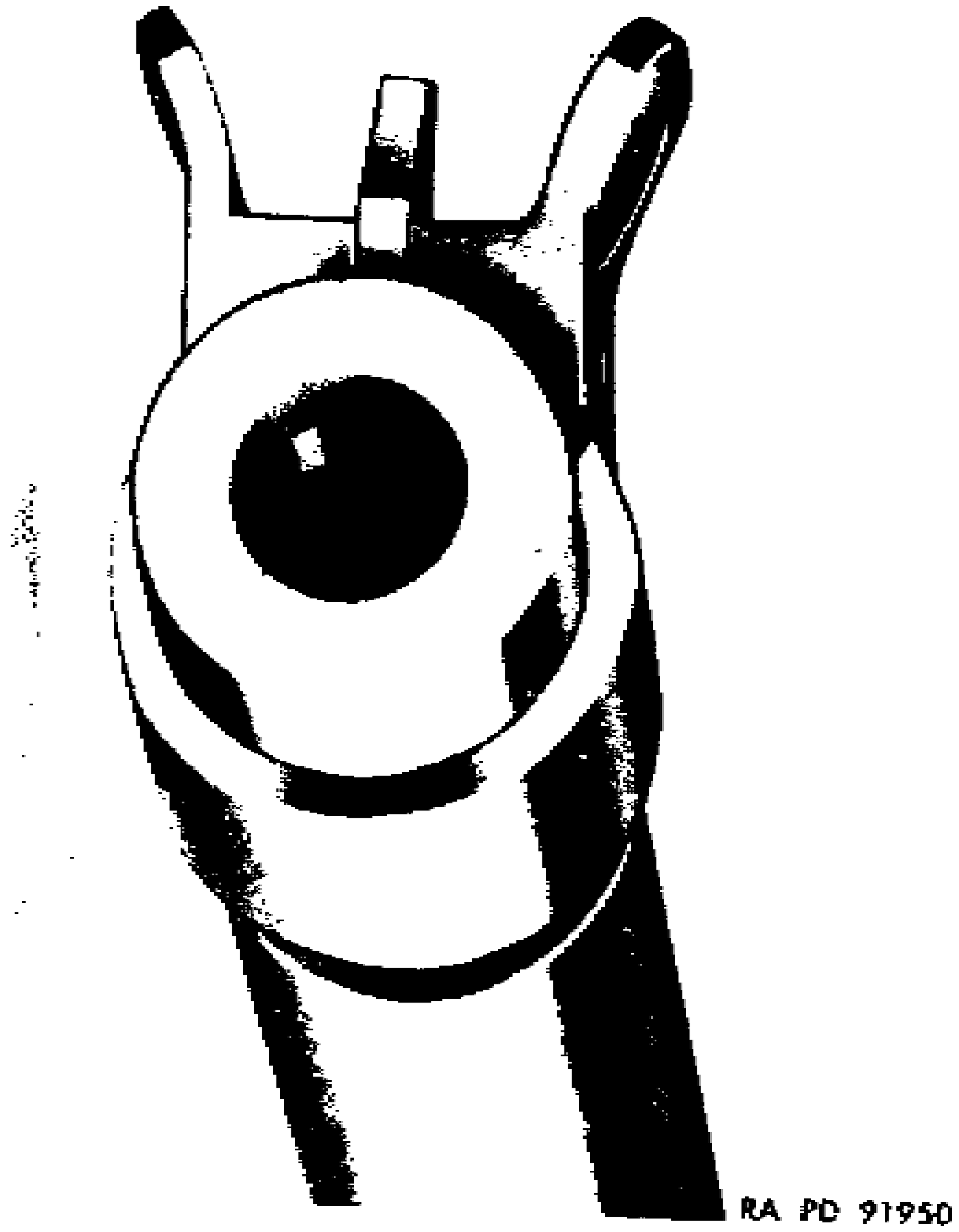


Figure 79. Muzzle end of barrel showing counterbore.

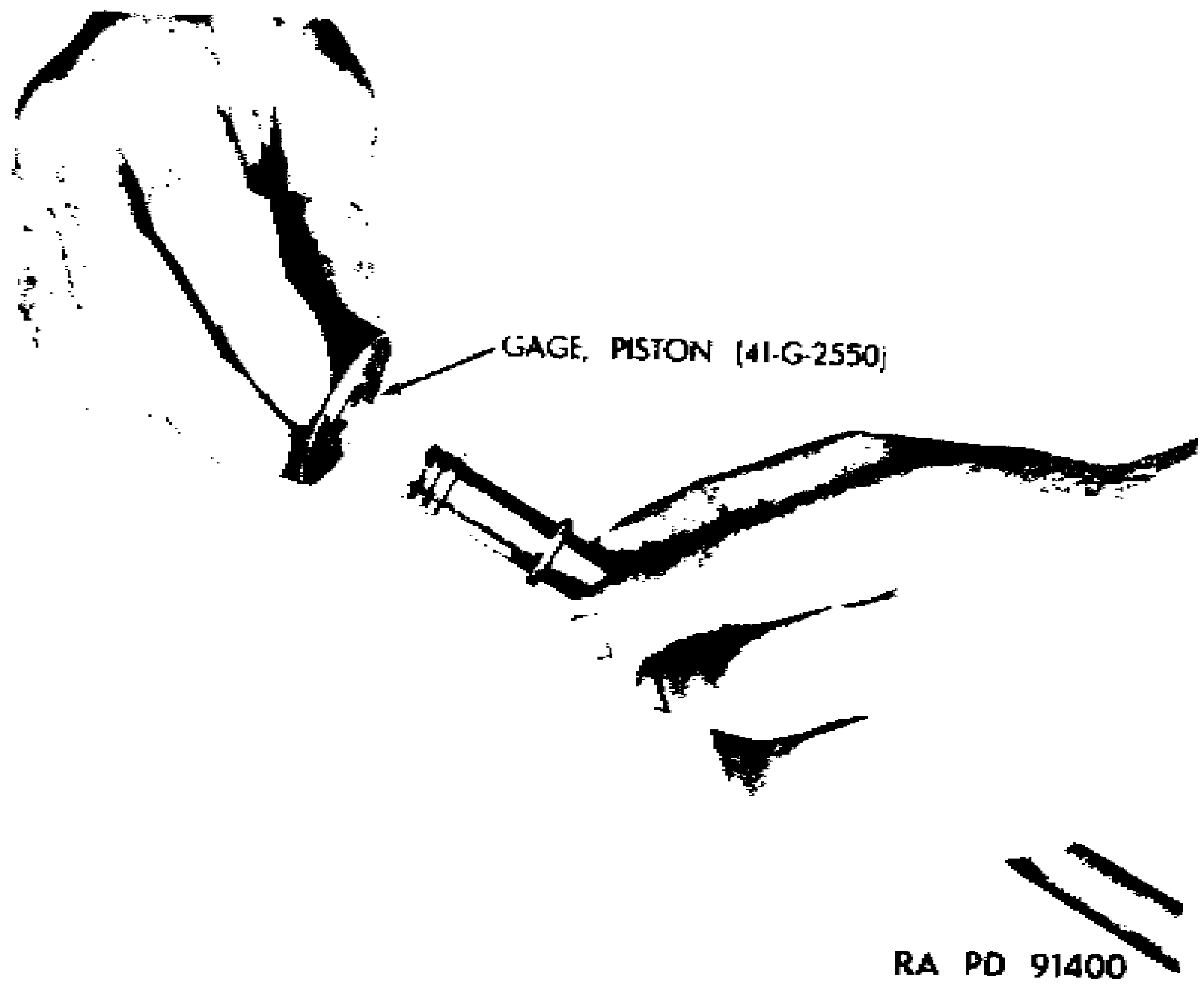


Figure 80. Chamber end of barrel showing old and new type skirt.

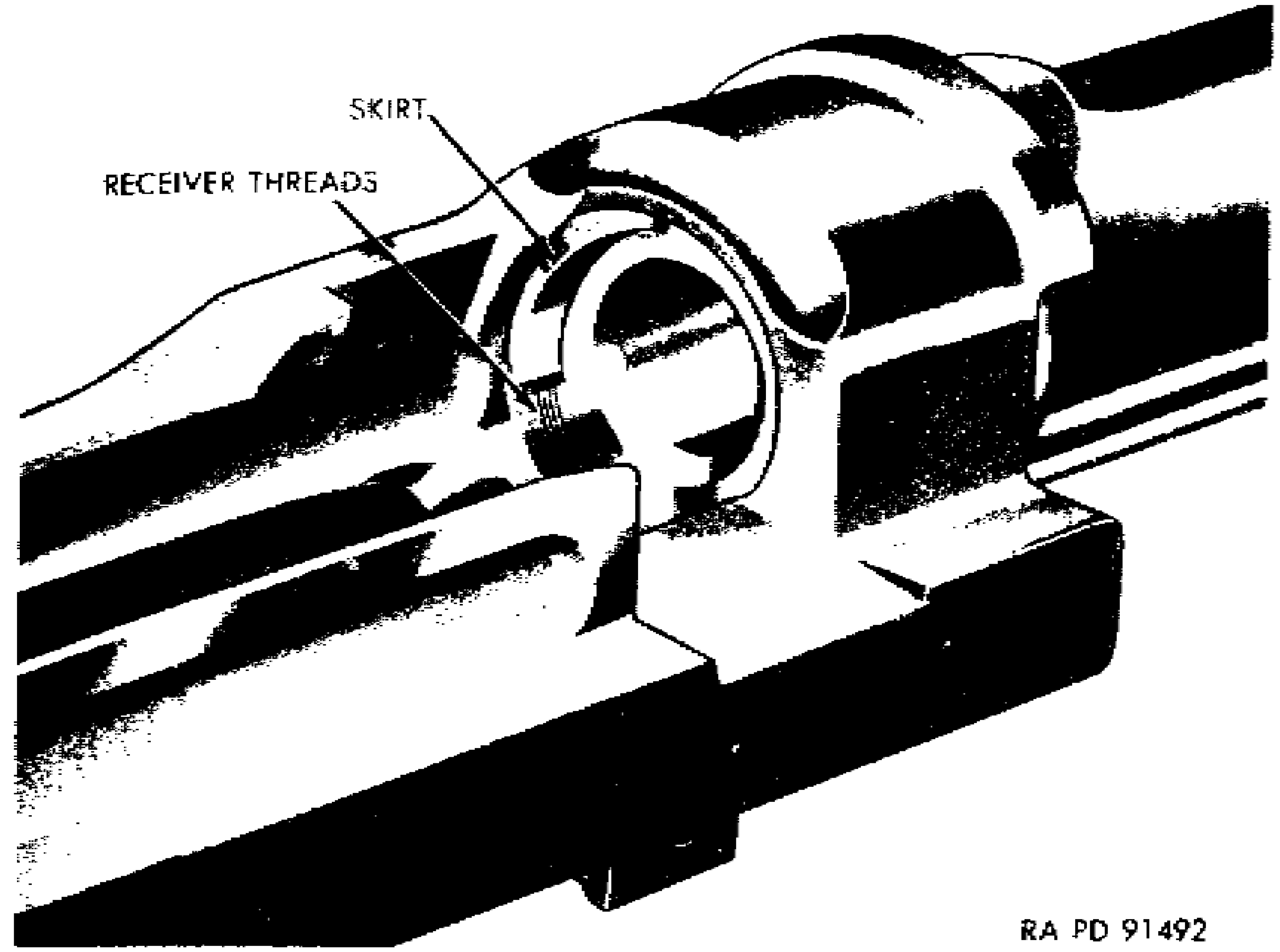


Figure 81. Breech and barrel showing new type skirt.

(*i*) In the establishments where it is practicable to perform barrel straightening operations, the barrels may be straightened if necessary to meet targeting requirements (DEPOT MAINTENANCE ONLY). Barrels that are rejected because they do not meet targeting requirements but are otherwise serviceable, should be retained in the depot maintenance shop until a sizable quantity has accumulated, whereupon disposition instructions should be requested from Chief of Ordnance, Washington 25, D. C., ATTN: ORDFM. The use of drop plug gages to check the straightness of the bore is not required. However, if the depot maintenance establishment performing the work deems it practicable, such gages as shown on drawing B7317562 are authorized for use in process inspection, local fabrication, and maintenance.

(*j*) Check to see that the new type front band assembly (fig. 82) is used and that the rivets are tight. Visually inspect bayonet stud on front band to assure that it is in good condition. Modification Work Order ORD B28–W5 specifies that the old type front band assemblies must be replaced with the new type (fig. 82) and describes the procedure. Check shape of front band swivel to assure that it swivels properly.

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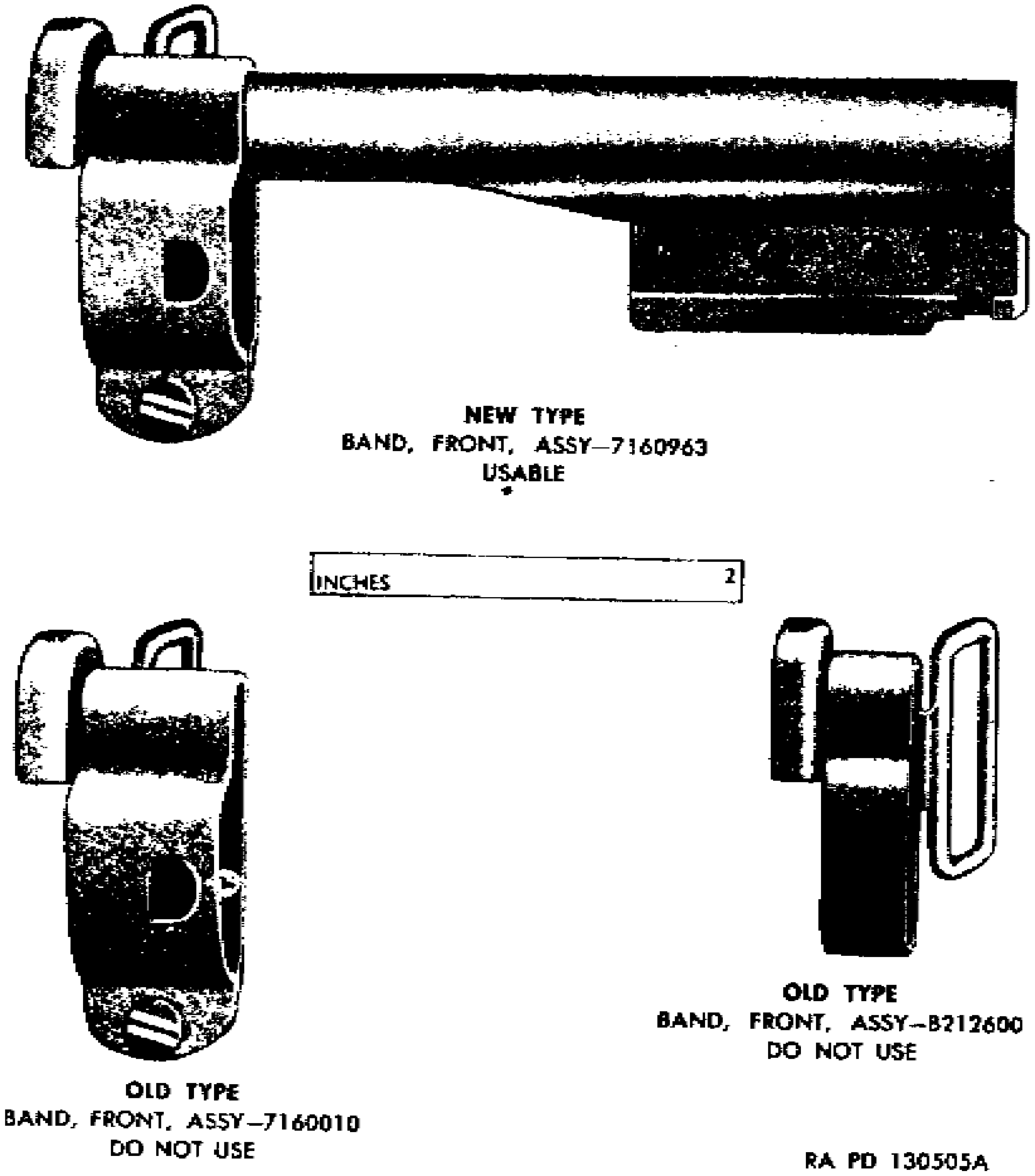


Figure 82. Front band assemblies.

c. Gas Cylinder Group.

(1) Inspect the swaged-on type cylinder to assure that it is tightly swaged onto the barrel, as determined by a hand test. Check all gas cylinders for deformation, piston wear, burrs, carbon, and rust, and check the gas port for foreign matter, using a 0.070-inch drill or plug inserted by hand.

(2) Inspect piston for wear, burrs, and carbon.

(3) Inspect piston nut for loose fit in gas cylinder. Inspect threads and turning lugs for wear and burrs. Inspect piston aperture for burrs. Piston should be an easy fit in aperture. Examine to determine that the gas cylinder has been staked very lightly into the nut in one place only (par. 59*b*).

(4) Check carbines M2 and M3 to assure that only the counterbored piston nut is used. In the carbine M1 and M1A1, either the counterbored nut or the earlier type without the counterbore is usable; if a carbine lacks power with the uncounterbored nut, replace with a counterbored type (fig. 38).

(5) After the piston and nut are assembled in the gas cylinder, check to assure that there is no binding.

(6) Inspect receiver for looseness with barrel, deformation, rust, and burrs. If receiver is disassembled from barrel, inspect for worn or crossed threads in barrel aperture.

d. Check Chamber for Proper Head Space (par. 15*g*).

Note. When using the head space gage, disengage the bolt from the operating slide. There are two types of head space gages assigned the same stock numbers for same sizes (fig. 10). If the gage is of the design that has a rim, place the rim carefully under the extractor against the face of the bolt (fig. 83) if the extractor is assembled, thereby avoiding snapping the extractor over the gage. When the other type (shouldered), is used, it is inserted into the chamber first and the bolt closed on it. In closing the bolt to check the depth of the chamber, exert only the lightest finger pressure and make sure that the hammer does not exert pressure against the bolt.

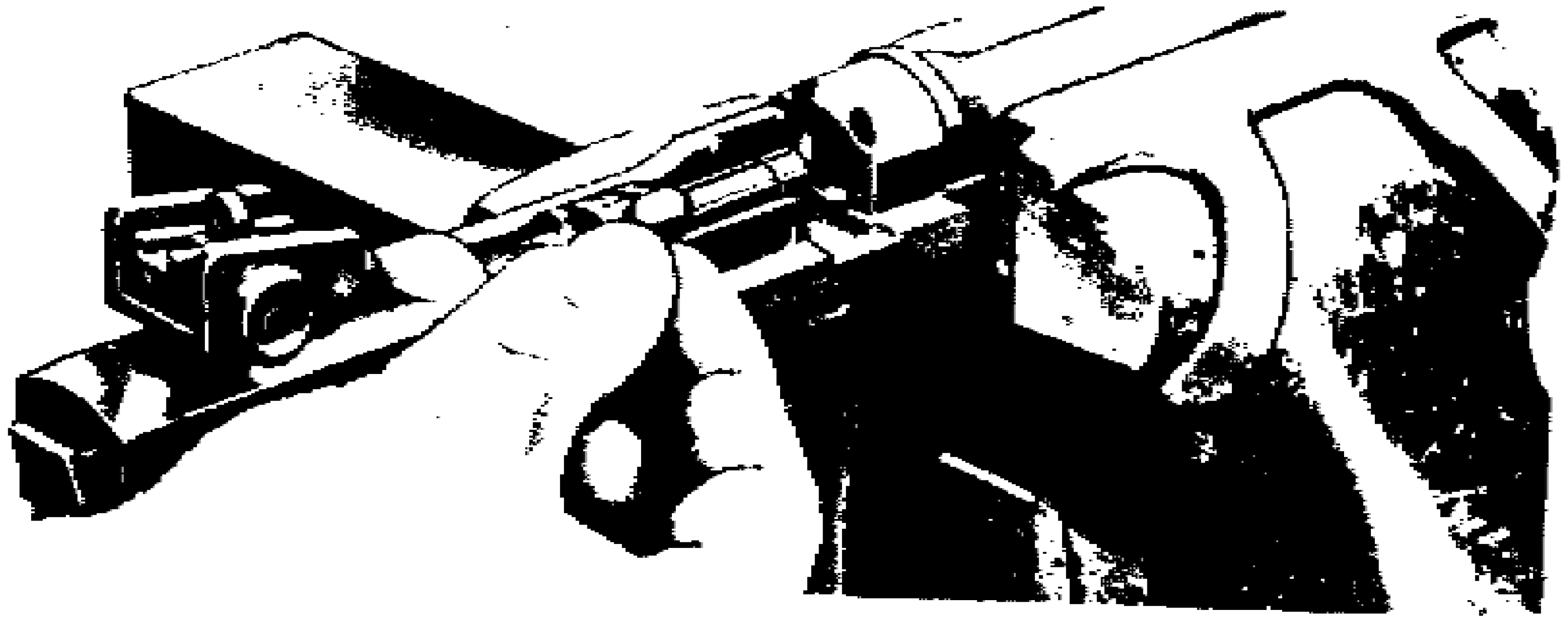
(1) Insert head space gage 7319934 (fig. 10) (head space length 1.290 inches) into chamber, wide cylindrical end first, and close bolt. The bolt must close on the gage. With a new barrel, the bolt may not close on the gage without being forced. This is an indication that the head space is insufficient and the chamber must be reamed. See paragraph 58*d* for procedure.

(2) Insert head space gage 7319938 (fig. 10) (head space length 1.298 inches). If the bolt closes without perceptible bite on the gage, the carbine is not acceptable for return to stock.

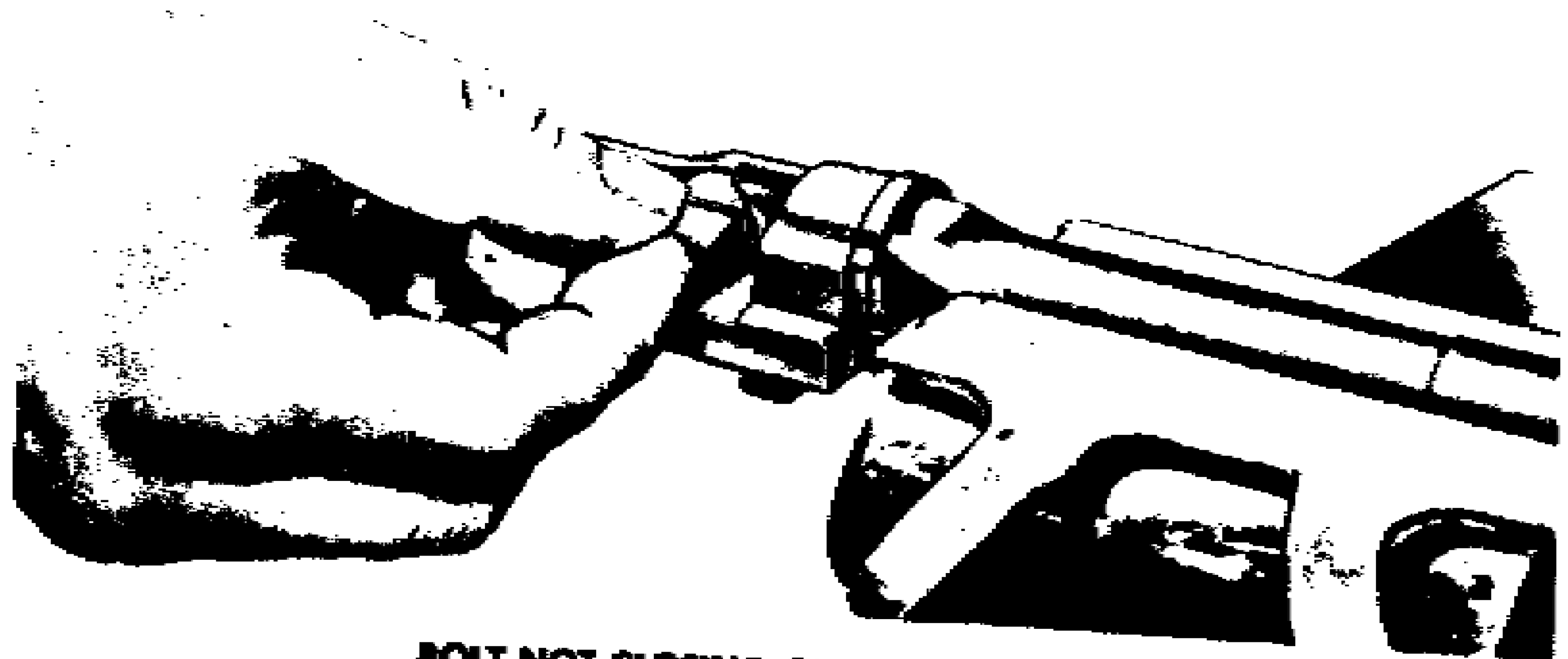
(3) Field test bolt 7319932 (fig. 10) (instead of carbine bolt) must close on head space gage 7319934 (head space length 1.290 inches). This is necessary to assure interchangeability. The field test bolt is dimensioned 0.560 inch from face to locking surface.

(4) When the carbine is rebarreled (DEPOT MAINTENANCE ONLY), every effort must be made to hold the head space as close as possible to 1.290 inches, using the field test bolt. Under no circumstances should head space exceed 1.295 inches on rebarreled carbines, using head space gage 7319936 (fig. 10) with the field test bolt.

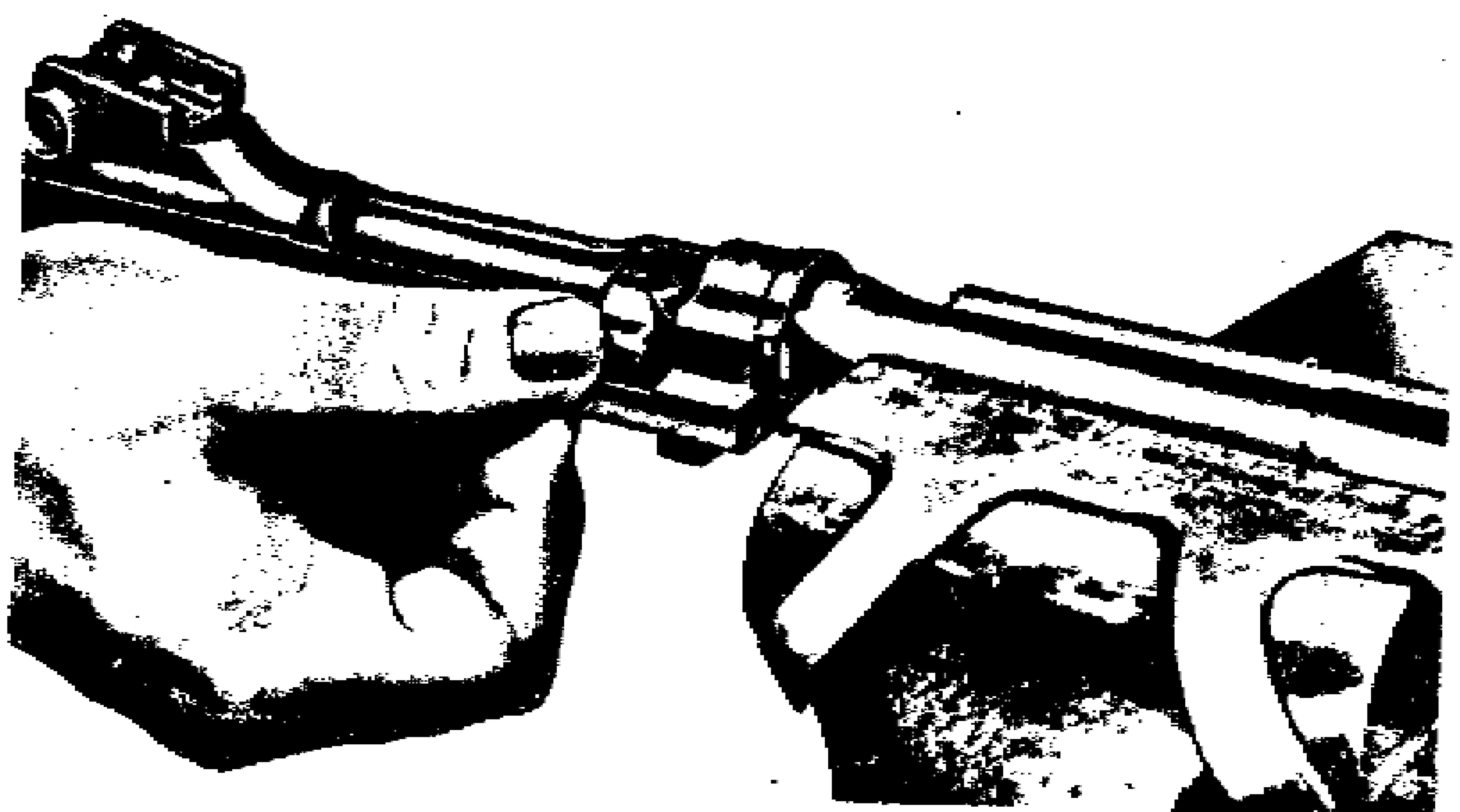
(5) Carbines whose head space is less than 1.302 inches, that is, component bolt does not close on head space gage 7319943 (figs. 10 and 83) are acceptable for domestic and overseas use (FIELD MAINTENANCE ONLY).



RIM STYLE HEAD SPACE GAGE PLACED IN FACE OF BOLT



BOLT NOT CLOSING ON 1.302 GAGE



BOLT CLOSING ON 1.290 GAGE

RA PD 130514

Figure 83. Checking head space.

e. Inspection After Assembly of Barrel and Receiver Group. After assembly of the barrel and receiver group, perform the following inspections:

(1) Check to assure that barrel has been staked at rear end of front sight.

(2) Check to assure that staking the front sight keyway and the application of the proofmark have not distorted the bore.

(3) Check front band screw to assure that head is in good condition and that it is staked or spun over sufficiently to prevent loss of screw.

(4) Check to assure that the ring portion of the front band surrounds the barrel with spring tension and check the swivel to assure that it swivels properly.

(5) Check to assure that the operating slide can be drawn all the way back to its stop against the receiver without binding.

58. Repair and Rebuild

a. Chasing Gas Cylinder Thread. Chase threads of the gas cylinder, using gas cylinder tap member of tool 7160995 (fig. 84). Dip tap in a cutting oil and start tap carefully in gas cylinder. Cut threads a little at a time, using a forward and backward movement. Exercise care to stop tap as soon as it touches bottom to prevent damaging tap or cylinder. Remove tap and thoroughly clean chamber.

b. Carbon and Rust.

(1) *Carbon.* Because of the rearward position of the gas port and high gas pressure encountered there, excessive carbonization of cylinder and piston is unlikely. However, these parts should be cleaned at regular intervals, or when fouling or sticking of piston is evident; the gas port in the barrel should be inspected and cleaned if necessary. Remove piston nut and piston from gas cylinder and scrape excess carbon off with flat blade. Take care not to scratch parts unnecessarily. When carbon has been removed, clean inside of cylinder and piston, oil very lightly and replace. Clean gas port with an 0.070-inch or smaller drill inserted by hand, or with piece of wire or similar instrument. Be sure to stake piston nut lightly in place when assembling.

Note. Pistons, breech end of receivers, and other parts subjected to burned powder must be thoroughly cleaned. Scrub these parts with a bristle brush moistened with rifle-bore cleaner.

(2) *Rust.* Rust is more likely to form on surfaces not regularly lubricated, or where barrel heat dissipates oil film rapidly. Such points are under side of barrel, body of oiler beneath sling, receiver locking lug recess in recoil plate, operating

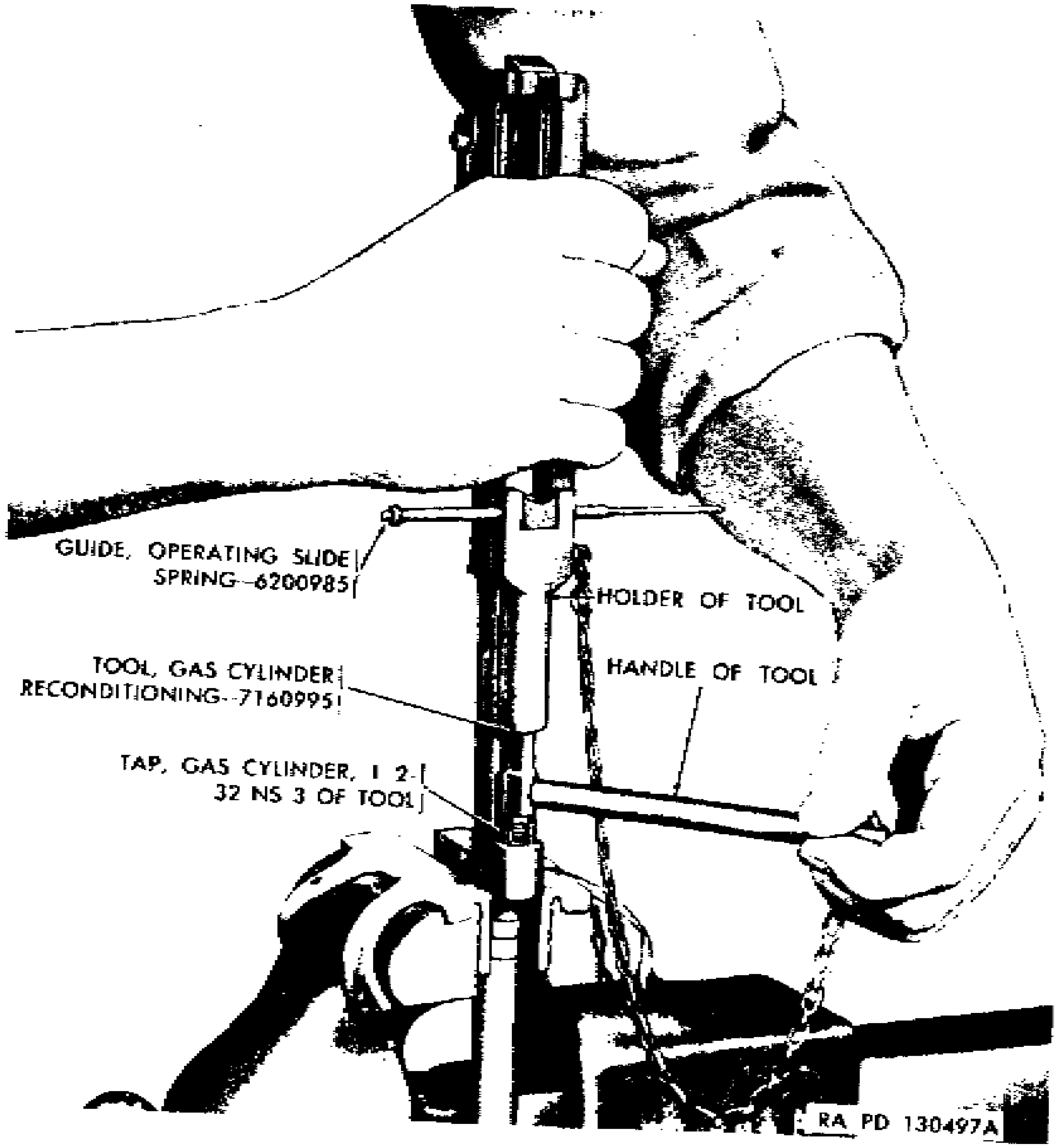


Figure 84. Chasing gas cylinder thread.

slide spring, well in receiver ("alternate" design receiver) or spring housing tube, rear sight base, inside faces of operating slide, recesses in trigger housing, and unexposed recesses and faces. Remove rust with a rag saturated with rifle-bore cleaner, preservative lubricating oil (special) or by using crocus cloth, but exercise care to avoid scratching surfaces. After rust is removed, wipe surface with clean, dry cloth and then with clean cloth lightly saturated with preservative lubricating oil (special). The operating slide spring housing (or tube) may be cleaned with the carbine cleaning rod and small patch. Be sure rear end of tube is clean.

c. Refinishing of Barrel and Receiver. When necessary to sand or grit blast to remove rust or otherwise prepare the barrel and receiver for refinishing, remove the rear sight and front band. If practicable, the front sight should be kept mated with the barrel and receiver assembly from which it is removed. When original finish is reasonably satisfactory, the removal of front and rear sights and the front band to permit sand blasting, in order to obtain the highest quality protective finish, is not required. During any refinishing of the barrel and receiver, the gas cylinder, muzzle, and breech end of the barrel must be plugged with corks to prevent solution from entering the bore or the cylinder portion of the gas cylinder. By drilling a 3/16-inch hole through the rear end of the receiver into the operating slide spring hole, good circulation of phosphating solutions and preservative compounds can be obtained.

d. Reaming Chamber.

(1) Dip breeching space reamer 7319906 (fig. 9) in lard oil and place in chamber through top opening of receiver (fig. 85). Turning handle slowly to the right, remove only sufficient metal to permit bolt to close on head space gage 7319934 (fig. 10) (head space length 1.290 inches).

(2) Wash chips from reamer and chamber with lard oil after removing from chamber.

(3) Handle reamer with care to prevent it from being chipped or picked. Never turn reamer backwards in chamber as this tends to dull the cutting edges.

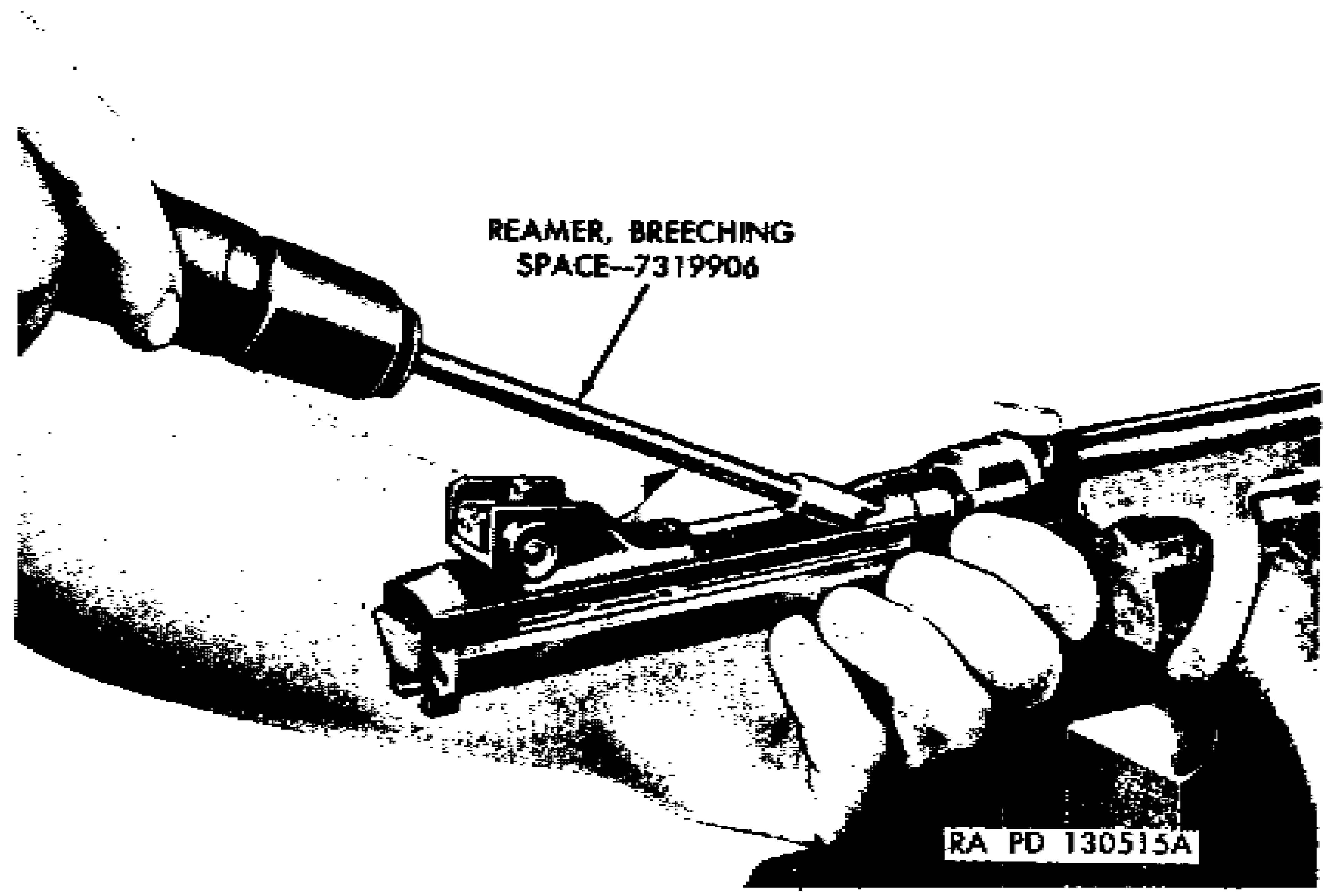


Figure 85. Reaming chamber for head space.

e. Restoring Serial Numbers (FIELD AND DEPOT MAINTENANCE). Serial numbers which have become obscured because of the installation of the adjustable rear sight must be restored. Since the degree of obscurity varies, this will be effected in one of two ways:

(1) if the serial number is questionable (fig. 86) (one digit obscured), use white graduation filler 52-F-100-230, listed in Department of the Army Supply Catalog ORD 3 SNL K-1, to improve the legibility; and (2) if the serial number is obscured (fig. 86), it will be relocated on the receiver bridge directly forward of the rear sight platform (fig. 87).

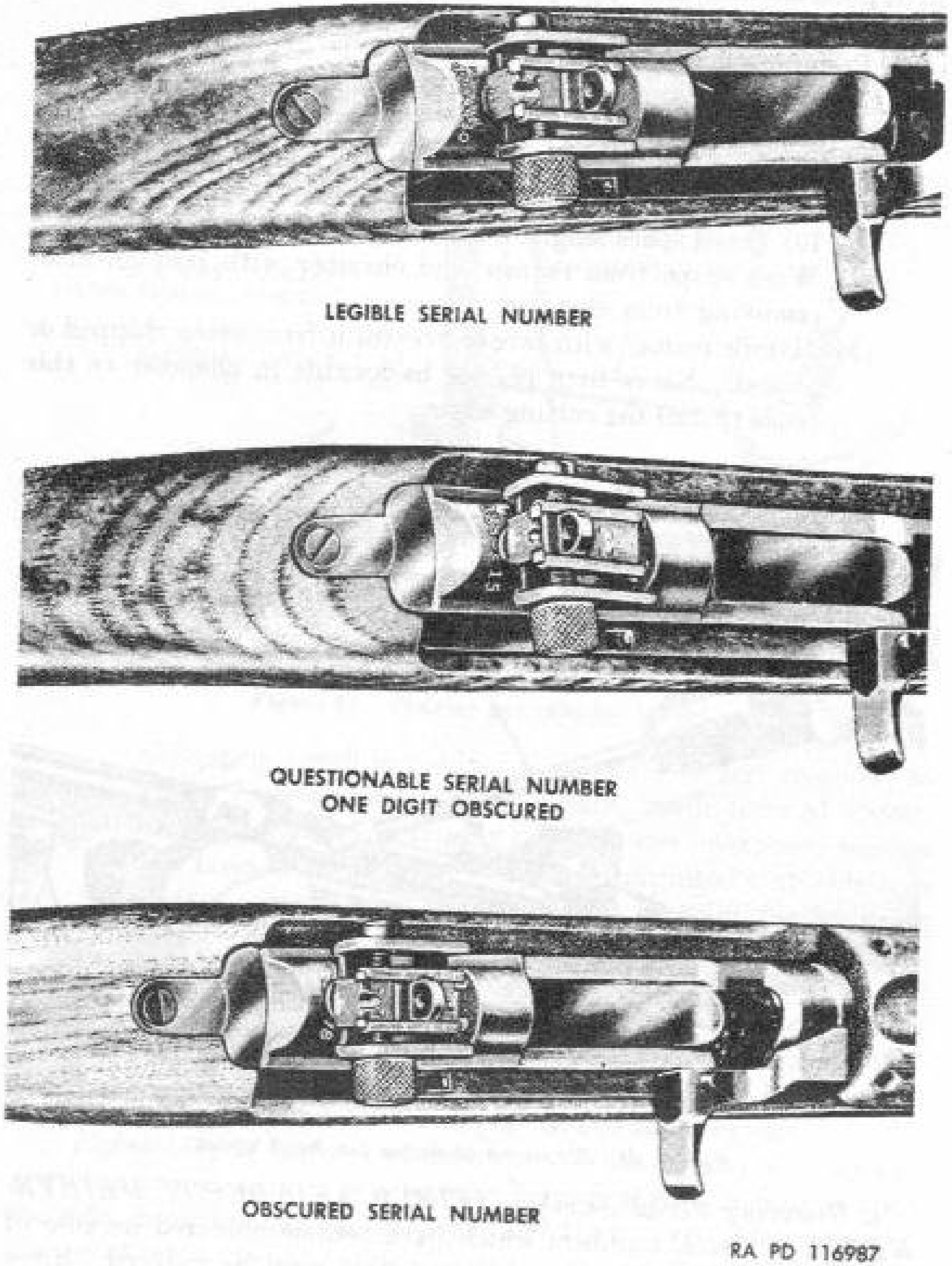


Figure 86. Serial numbers on cal. .30 carbines.

(1) *Questionable serial numbers (FIELD MAINTENANCE ONLY).*

(*a*) Mask the adjustable rear sight to prevent filler from entering the sight.

(*b*) Work a small quantity of filler into the serial number and allow it to dry for 5 minutes. Wipe off all excess filler with a clean rag and allow to dry for 3 hours.

(*c*) In the event that the application of filler fails to restore the legibility of the serial number, relocation of the number by depot maintenance personnel is required.

(2) *Obscured serial numbers (DEPOT MAINTENANCE ONLY).* Maintenance organizations engaged in restamping serial numbers will fabricate fixtures locally to reinforce and clamp the receiver during the stamping operation. Two fixtures have been developed for this purpose; the vise-held stamping fixture (figs. 88 and 89) and the bench-mounted stamping fixture (figs. 90 and 91). The choice of fixture which best suits the requirements of the maintenance organization is left to the discretion of that organization.

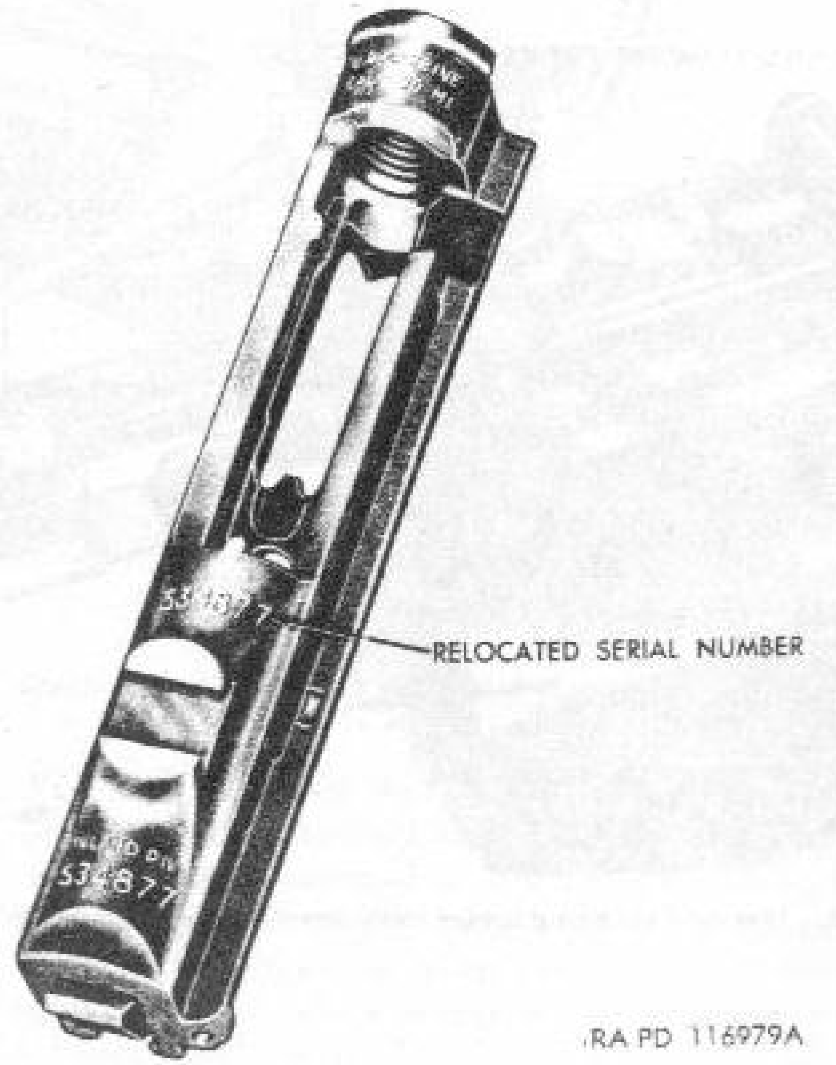


Figure 87. Relocated serial number on cal. .30 carbines.

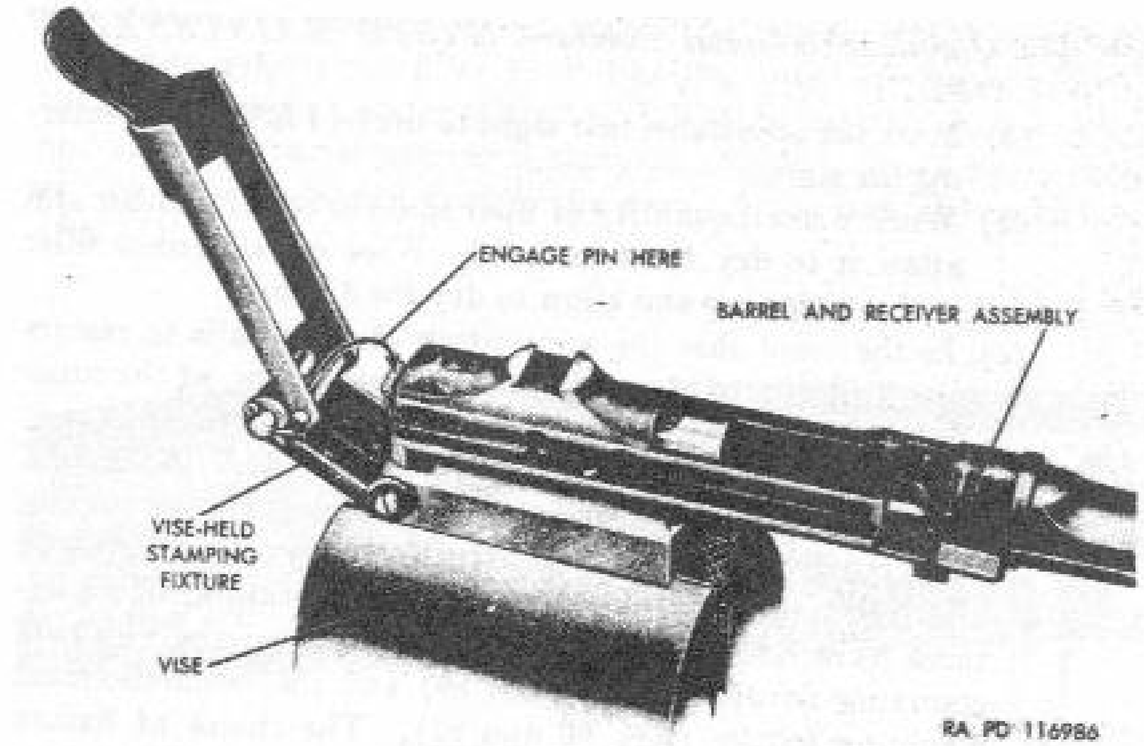


Figure 88. Placement of barrel and receiver assembly in vise-held stamping fixture.

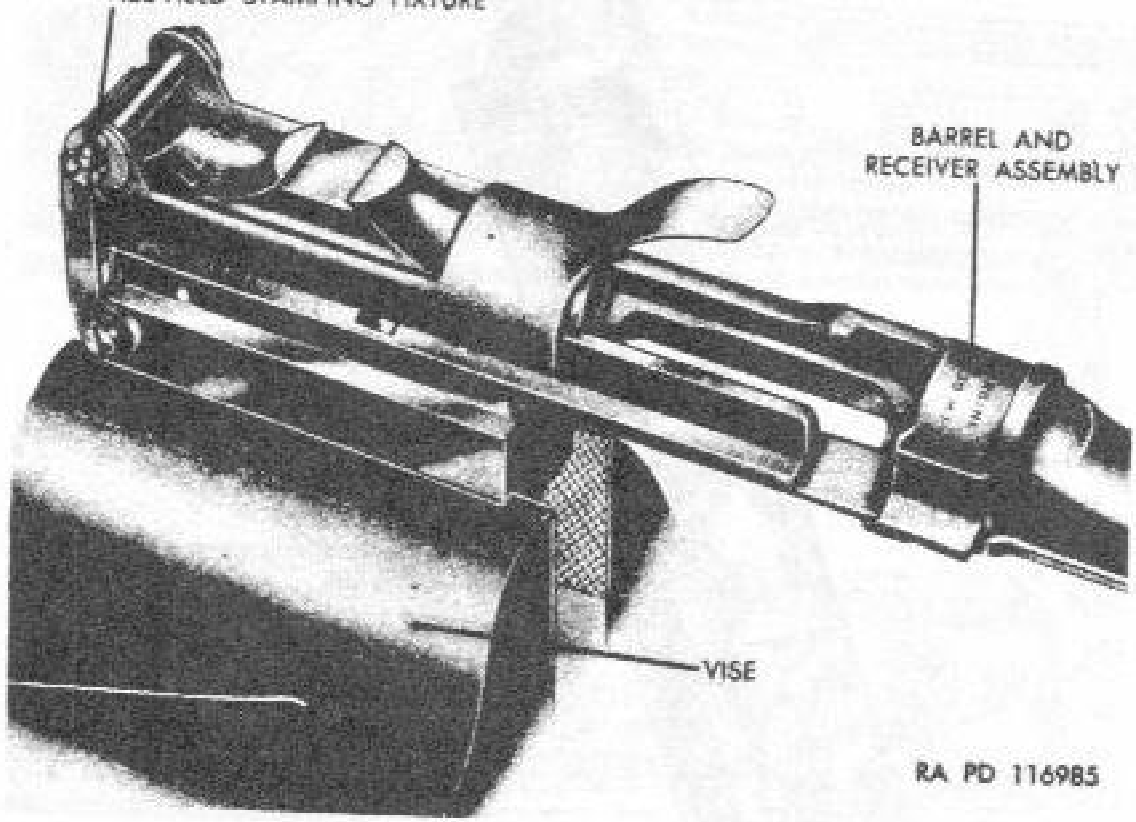


Figure 89. Vise-held stamping fixture with barrel and receiver assembly in place.

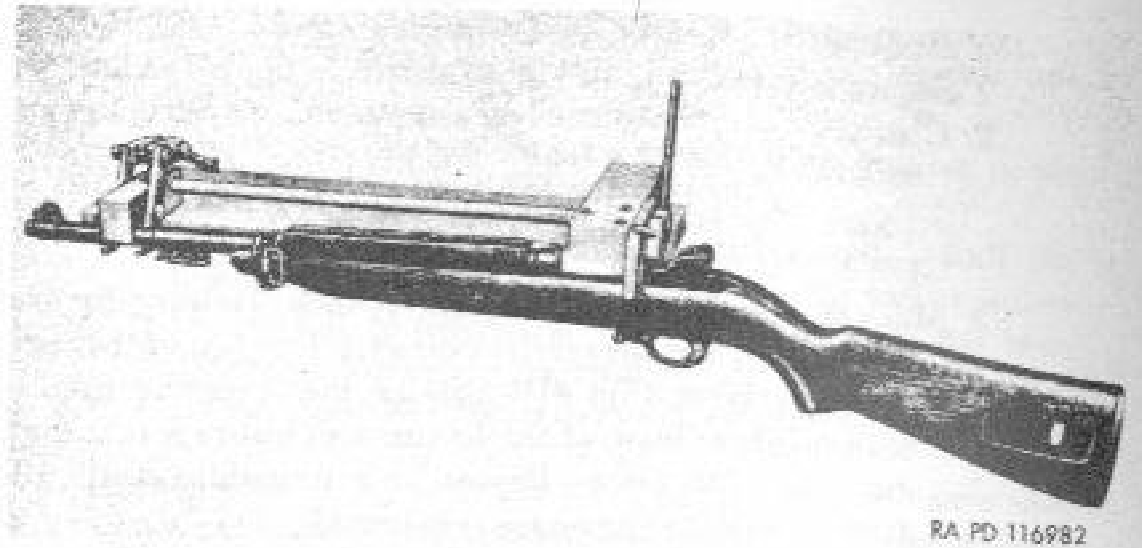


Figure 90. Carbine clamped in bench-mounted stamping fixture.

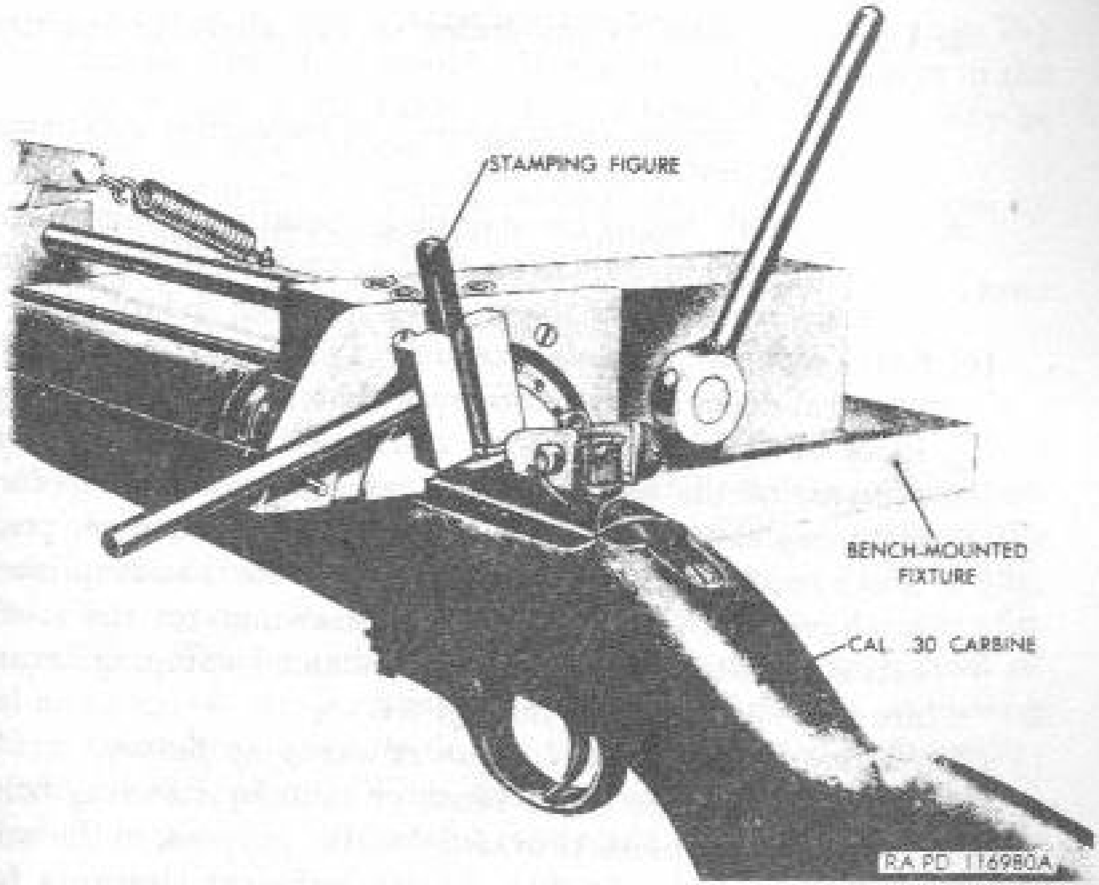


Figure 91. Bench-mounted stamping fixture with carbine and stamping figure in place.

(*a*) *Vise-held stamping fixture.* This fixture is relatively simple to fabricate, requires little space for storage, and may be quickly mounted in any vise. However, it is not adaptable at maintenance installations where large quantities of carbines are to be restamped, since the carbines must be disassembled before relocation of serial numbers can be accomplished. Detailed working drawings for fabrication and assembly of the vise-held stamping fixture are shown in figures 15 through 23.

(*b*) *Restamping with vise-held stamping fixture.*

1. Secure fixture firmly in vise as shown in figures 88 and 89.

2. Clamp the barrel and receiver assembly in the fixture (figs. 88 and 89).

Note. The fixture is so designed that disassembling the barrel and receiver assembly is not required.

3. Manually position and space the 3/32-inch stamping fixture on the bridge of the receiver directly forward of the rear sight platform (fig. 87). Strike the stamping fixture with one firm blow of the hammer to insure a neat and distinct impression. Repeat this procedure until all digits of serial number are transposed.

Note. The 3/32-inch stamping fixture is not included in the supply system and must be procured locally.

4. Use white filler as prescribed in (1) above to increase legibility.

Note. Under no circumstances will the original serial number be obliterated.

5. Upon completion of the stamping operation, assemble the carbine and operate through the complete firing cycle to determine whether the receiver has been deformed.

(*c*) *Bench-mounted stamping fixture.* This fixture is especially useful at depot maintenance installations where large quantities of carbines are to be restamped because only the removal of the bolt from the carbine is required before clamping the carbine in the fixture. Furthermore, positioning and spacing of the stamping fixture is accomplished mechanically. Detailed working drawings for the fabrication and assembly of the bench-mounted stamping fixture are shown in figures 24 through 34.

(*d*) *Restamping with bench-mounted stamping fixture.*

1. Secure the fixture to the bench or table by inserting bolts through the holes, provided for this purpose, in the base of the fixture (fig. 25). Allow sufficient clearance for the unobstructed insertion of the carbine in the fixture.

2. Remove the bolt from the carbine and clamp the carbine in the fixture, as indicated in figures 90 and 91.

3. Place a 3/32-inch stamping fixture in the stamping guide of the fixture (fig. 91). Position and space the stamping fixture by adjusting the stamping guide. Strike the stamping fixture with one firm blow of the hammer to insure a neat and distinct impression. Repeat this procedure until all the digits of the serial number are transposed.

Note. The 3/32-inch stamping fixture is not included in the supply system and must be procured locally.

4. Upon completion of the stamping operation, install the bolt in the receiver and operate through the complete firing cycle to determine whether the receiver has been deformed during the stamping operation.

Note. Under no circumstances will the original serial number be obliterated.

(*e*) *Inspection.* All carbines will be inspected to insure that the relocated serial number is a duplicate of the original serial number.

f. Counterbore Muzzle.

(1) The muzzle of all barrels must be counterbored (fig. 79) during rebuild to remove tool marks, nicks, and burrs in the muzzle end of the barrel. A chamfering tool which may be used for this purpose is illustrated in figure 35.

(2) The depth or diameter of counterbore will be determined by the amount of blemishes to be removed.

(3) All barrels will be counterbored slightly during rebuild, even though there is no visible blemish.

59. Assembly

a. Replacing Barrel. Select proper barrel and receiver combination so that about 1/16-inch draw is obtained when assembled. Screw the receiver on the barrel with receiver and barrel wrench 7113308 (fig. 9); draw up receiver until alinement marks on barrel and receiver (fig. 92) coincide. Then determine that the flat surfaces on bottom of barrel and receiver are parallel. Check this by indicator or placing two bars, about 10 inches long, in position as illustrated in figure 93; and sight over the edges. When the two bars lie parallel, the barrel and receiver are in exact alinement for proper functioning.

Note. After installing barrel on receiver, adjust and check the head space as described in paragraphs 57*d* and 58*d*.

b. Gas Cylinder Piston and Nut. Insert gas cylinder piston into cylinder and screw cylinder piston nut into the threads using gas cylinder reconditioning tool 7160995 (fig. 84) (with component wrench). Make certain to stake the cylinder lightly into the nut, in one of the three places provided, or the nut may work loose during the firing of the carbine. After the piston and nut are assembled in the gas cylinder, check to assure that there is no binding (par. 57*c*).

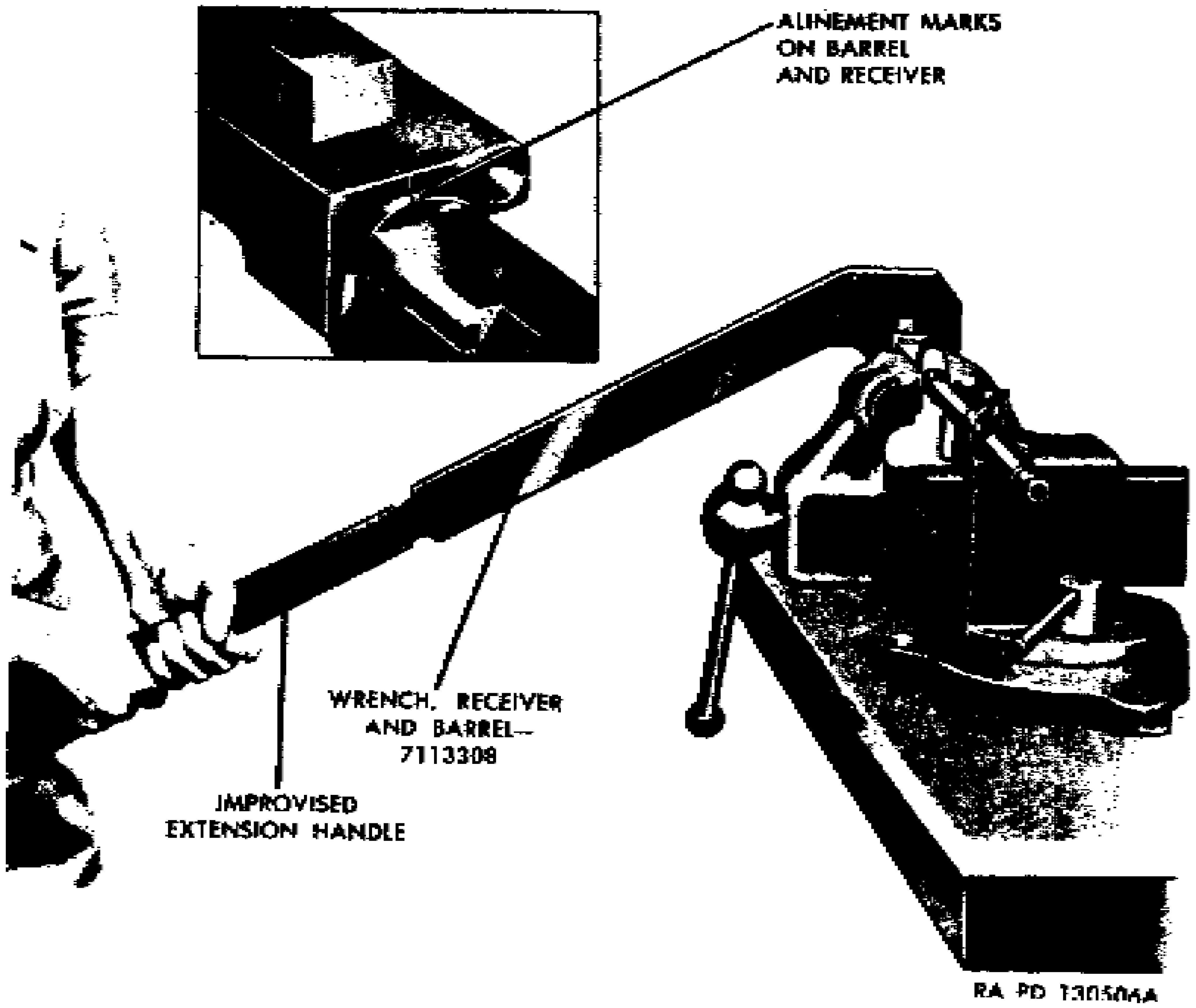


Figure 92. Assembling barrel to receiver.

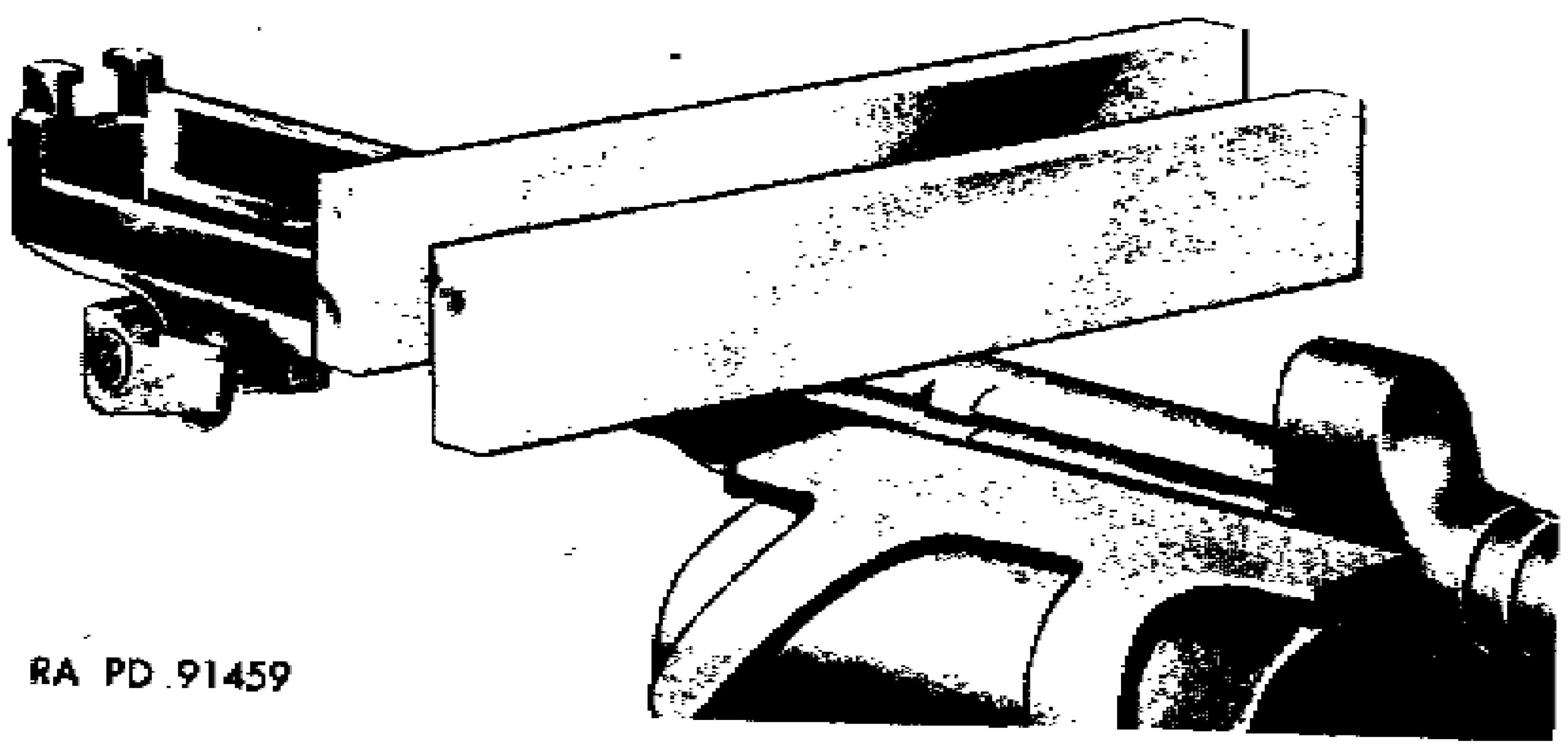


Figure 93. Checking barrel and receiver alinement.

Section X. STOCK GROUP—CARBINES M1, M2, AND M3

60. Disassembly (Field or Depot Maintenance)

a. Front Band Locking Spring (figs. 94 and 95). Insert small, straight punch in spring spindle hole in left side of forward end of stock and drive out front band locking spring part way, from left to right; then rotate spring and pull from hole.

b. Recoil Plate (figs. 94 and 95).

(1) Inscrew recoil plate screw counterclockwise until clear of escutcheon threads (above ¾ inch), then withdraw from stock and recoil plate.

(2) Loosen recoil plate by tapping lightly on rear top face with a metal tool. Pull plate directly forward out of seating recess in stock. Do not pull up or down, because rear seating lug on plate seats in a horizontal recess cut in the stock.

(3) Do not remove the recoil plate screw escutcheon from the stock except for replacement. To remove, thread recoil plate screw into the escutcheon from the under side until all of the threads of the escutcheon are engaged and pull escutcheon out of stock. If withdrawal is difficult, insert small straight punch from top of screw hole in stock and tap end of screw lightly to loosen escutcheon, or thread screw in from top, part way, and tap lightly; then proceed as above.

c. Butt Plate (figs. 94 and 95). Unscrew butt plate screw counterclockwise and remove from stock. Loosen butt plate by tapping it lightly. Pull to rear off stock. If butt plate is tight, do not pry off, as stock is likely to be damaged. Tap on edges lightly all the way around, until loose enough to pull from stock.

d. Hand Guard (figs. 94, 95, and 97). The liner of the hand guard assembly is riveted to the hand guard; do not remove it.

61. Inspection

a. Stock. Inspect stock for cracks, scoring, chipping, blemishes, and excessive dryness. Inspect cuts and apertures (fig. 96) for chipping and burrs, for wear due to interference with moving parts, and for excessive friction in assembling.

b. Butt Plate.

(1) Inspect butt plate for deformation, burrs, fit, and looseness on stock. Check butt plate screw for looseness and check threads in stock for stripping. The butt plate screw must fit firmly in stock.

(2) Protrusion of butt plate beyond edge of stock is acceptable in rebuilt weapons unless more than approximately one-half of the thickness of the metal extends beyond the edge of the

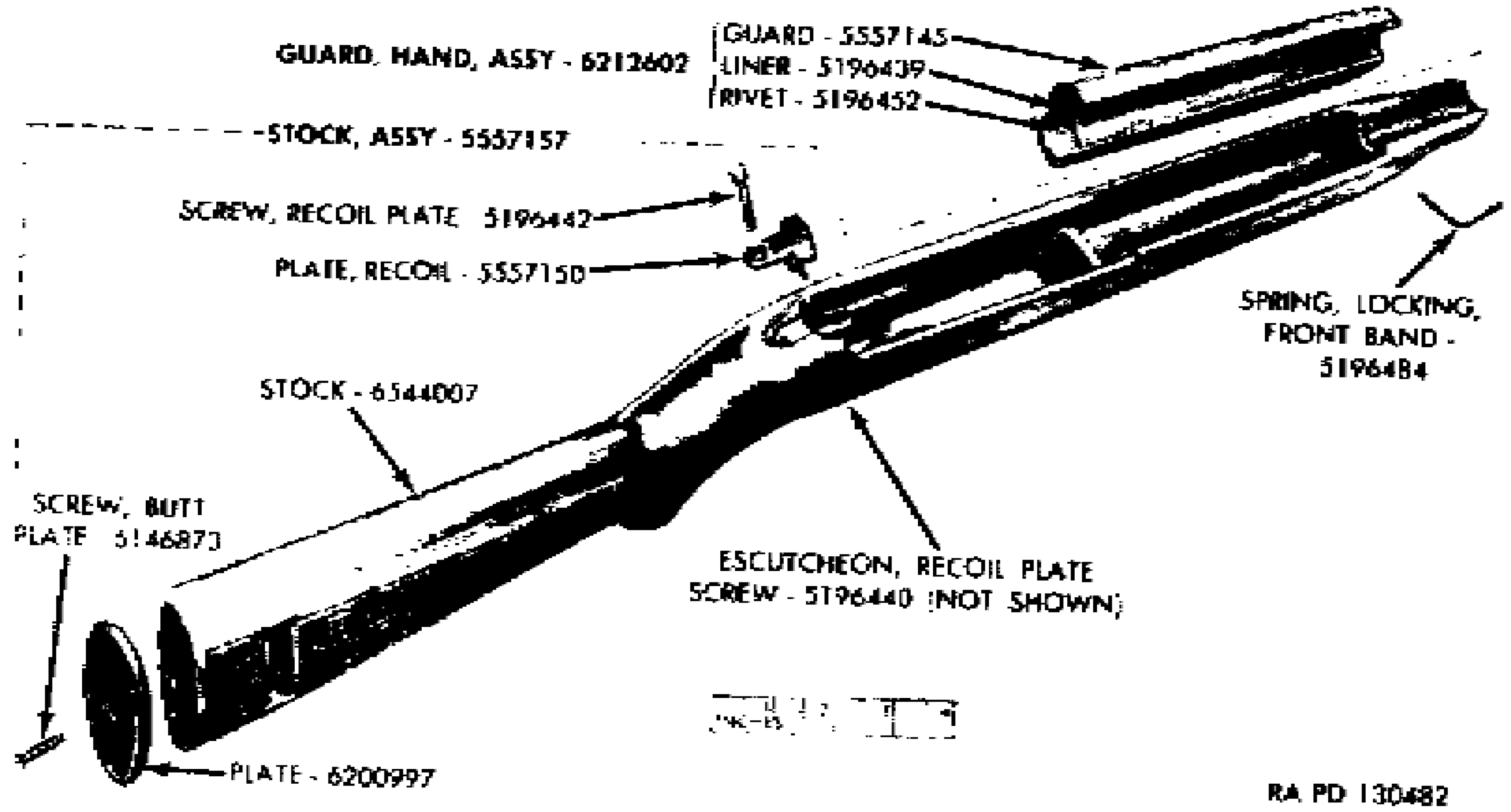


Figure 94. Stock and guard assemblies—carbine M1.

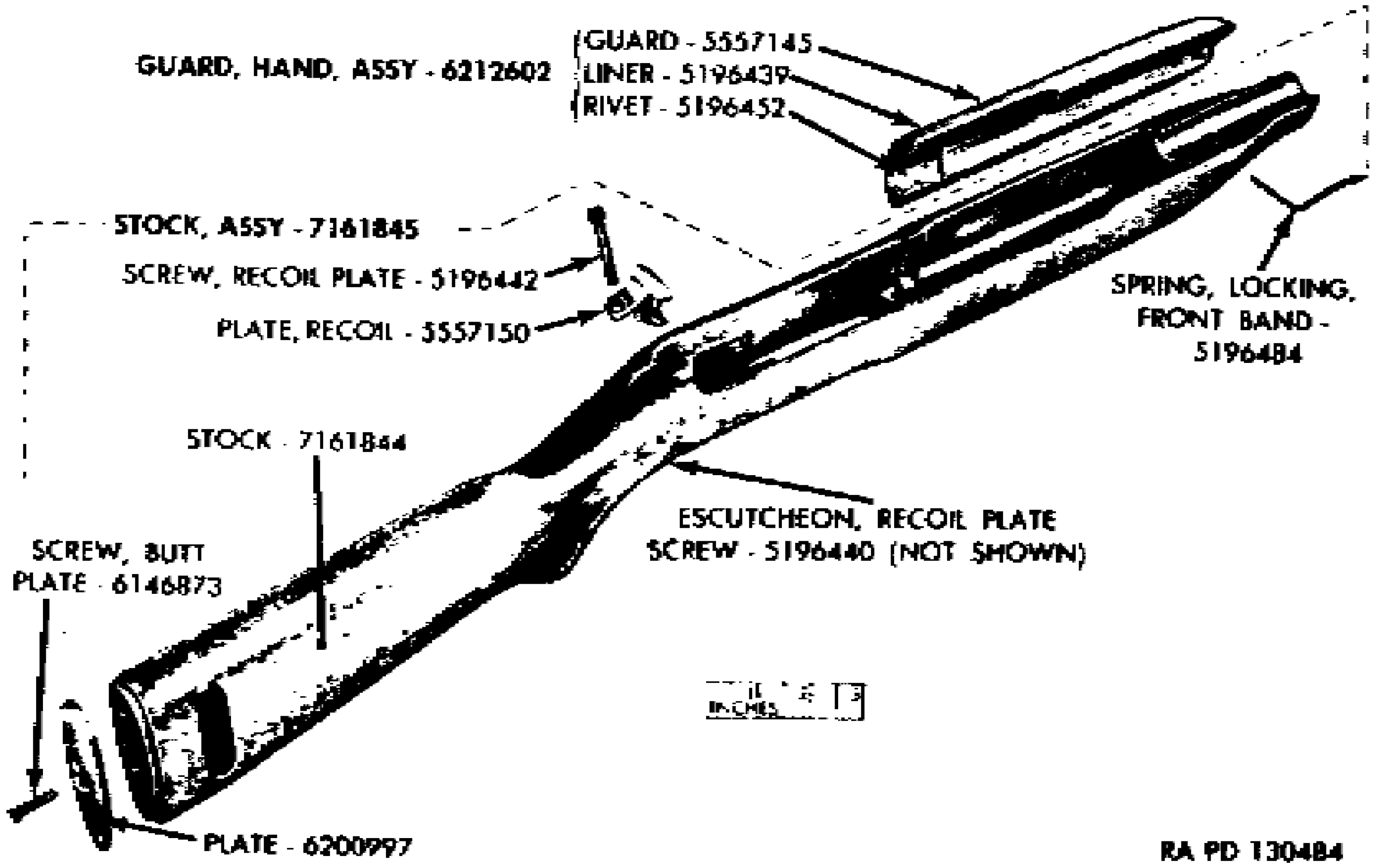


Figure 95. Stock and guard assemblies—carbines M1, M2, and M3.

stock. (This condition may arise from excessive sanding of the stock.)

c. Front Band Locking Spring. Inspect front band locking spring for deformation and excessive wear of locking shoulder. Rear face of shoulder should be square enough to retain front band in position.

d. Clearance Cuts. Although the same stock is used on carbines M2, M3, and late model M1, for the M2 and M3 examine clearance cut on right for disconnector and disconnector lever, and clearance cut on left side for selector (fig. 98). There must be no binding of either due to undersized cuts.

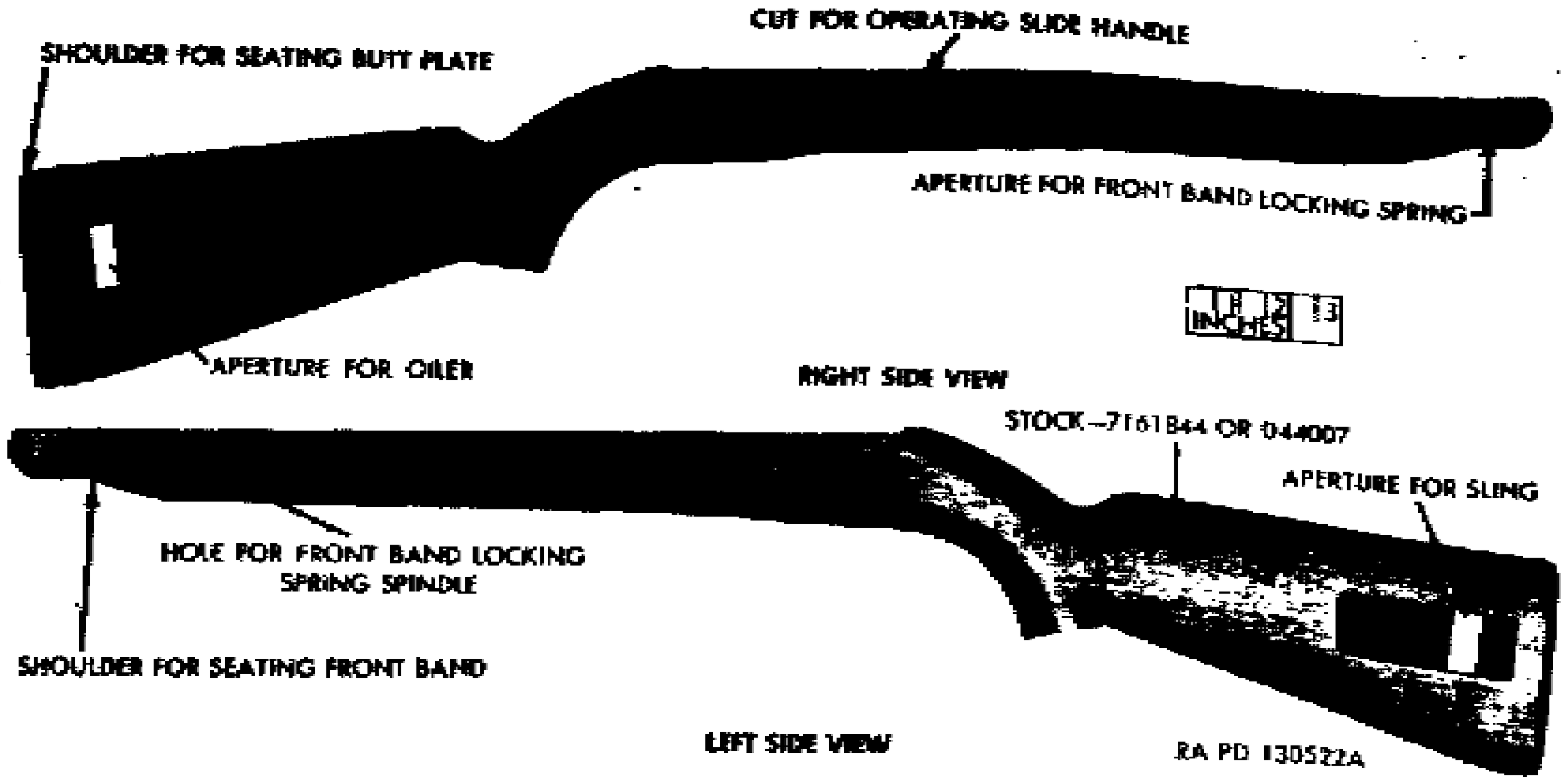


Figure 96. Stock showing apertures—carbine M1.

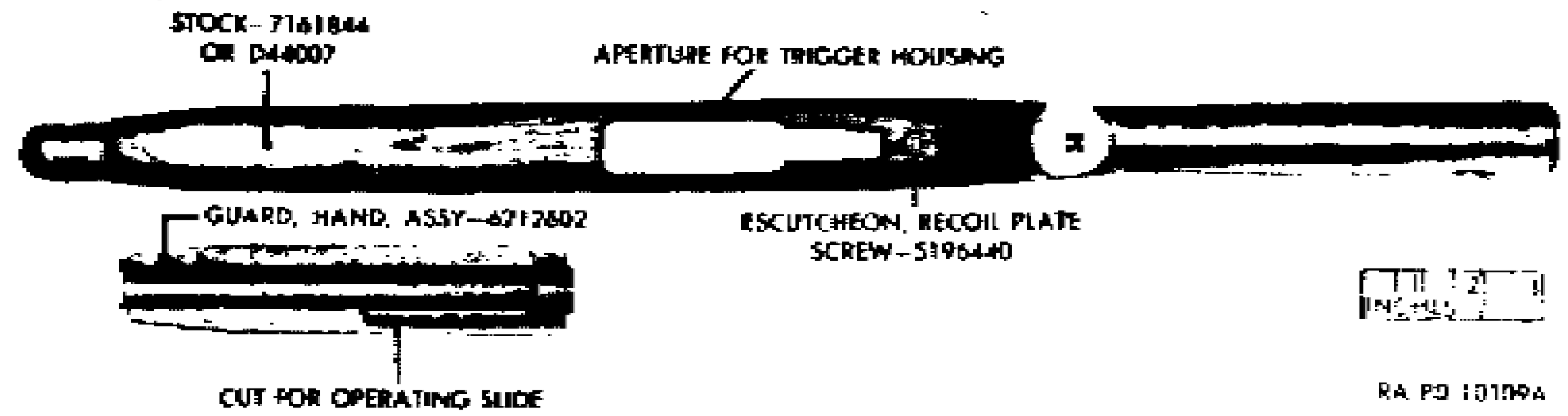


Figure 97. Stock and hand guard—carbine M1.

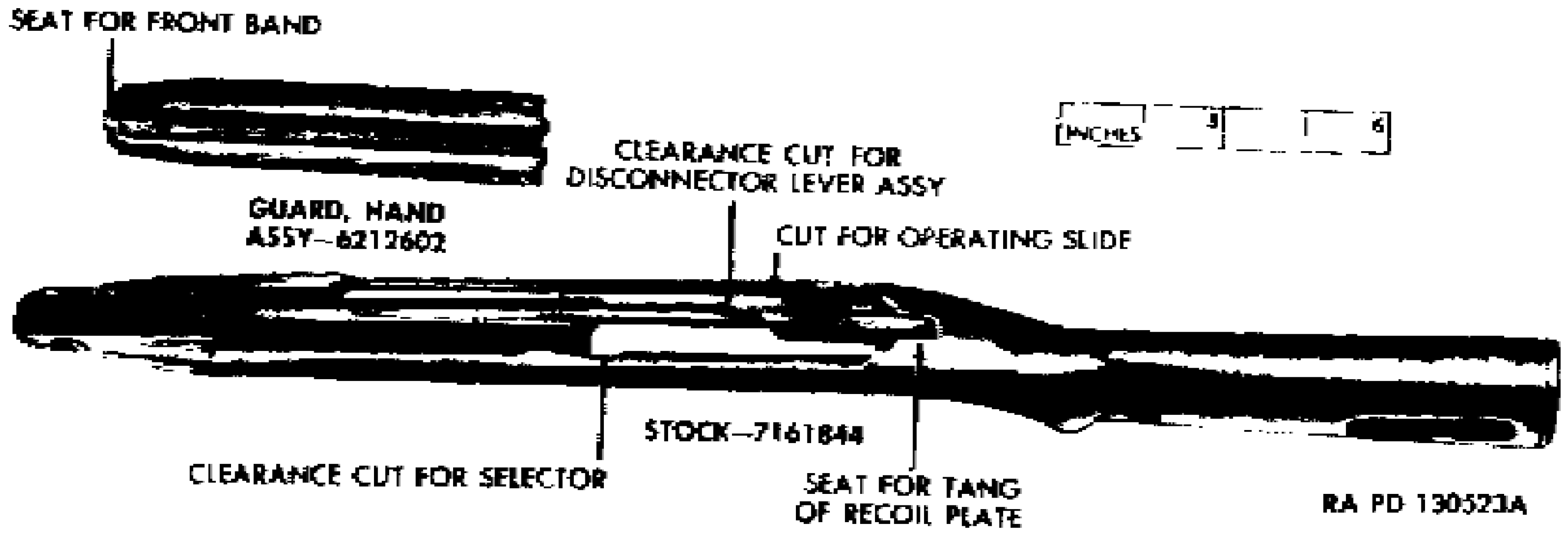


Figure 98. Stock and hand guard—carbines M1 (late), M2, and M3.

e. Recoil Plate. Check to assure that recoil plate is free from burrs, excessive wear (fig. 105) and rust, and that it is properly bedded in stock. Where recoil plate is bedded so deeply in stock that it interferes with proper alinement of action, the stock must be rejected. The recoil plate screw escutcheon should not turn in the stock, have burrs, or worn threads. The screw should be tightened firmly.

f. Fit of Action. Check fit of action in the stock. Clearance between recoil plate and receiver should not exceed 0.005 inch when checked with a feeler gage (DEPOT MAINTENANCE ONLY). See

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figure 99 for old and new type recoil plates. Both designs are usable if otherwise serviceable. Insert the recoil plate lug on the receiver into the recoil plate. With a slight pressure tending to push the barrel in the stock, rap the butt end sharply; the action should snap into place. The action then should be suspended by the recoil plate with clearance under the receiver and barrel. Test the action for longitudinal play. If such play exists or the action does not lie properly in the stock, a new stock assembly should be selected or the recoil plate replaced in order to meet the above requirements. This is particularly necessary in order to avoid injury to the stock assembly when the spring type recoil plate is used.

g. Trigger Housing Clearance. Check to assure that there is at least 0.010-inch clearance between rear end of trigger housing and stock. Use a feeler gage.

h. Hand Guard Liner. Check to assure that liner in hand guard assembly is not distorted and is securely fastened to hand guard. Liners with two rivets or with four rivets, if serviceable, may be used on carbines M1 and M1A1. Only the four-rivet type hand guard assembly 6212602 is to be used on the carbines M2 and M3 (fig. 100).

i. Hand Guard. Check hand guard to assure that front end, which is engaged by front band, is in satisfactory condition. The lengthwise fit of the hand guard should be sufficient to assure adequate engagement with the front band and the hood of the receiver.

j. Oiler. Inspect oiler to assure that new type neoprene washer is installed.

62. Repair and Rebuild

a. Binding of Parts with Stock.

(1) Binding of moving parts with stock or lack of proper clearance for assembly is evident on the stock by rubbed areas. Relieve such binding points by filing or paring, using fine file or sharp, flat blade.

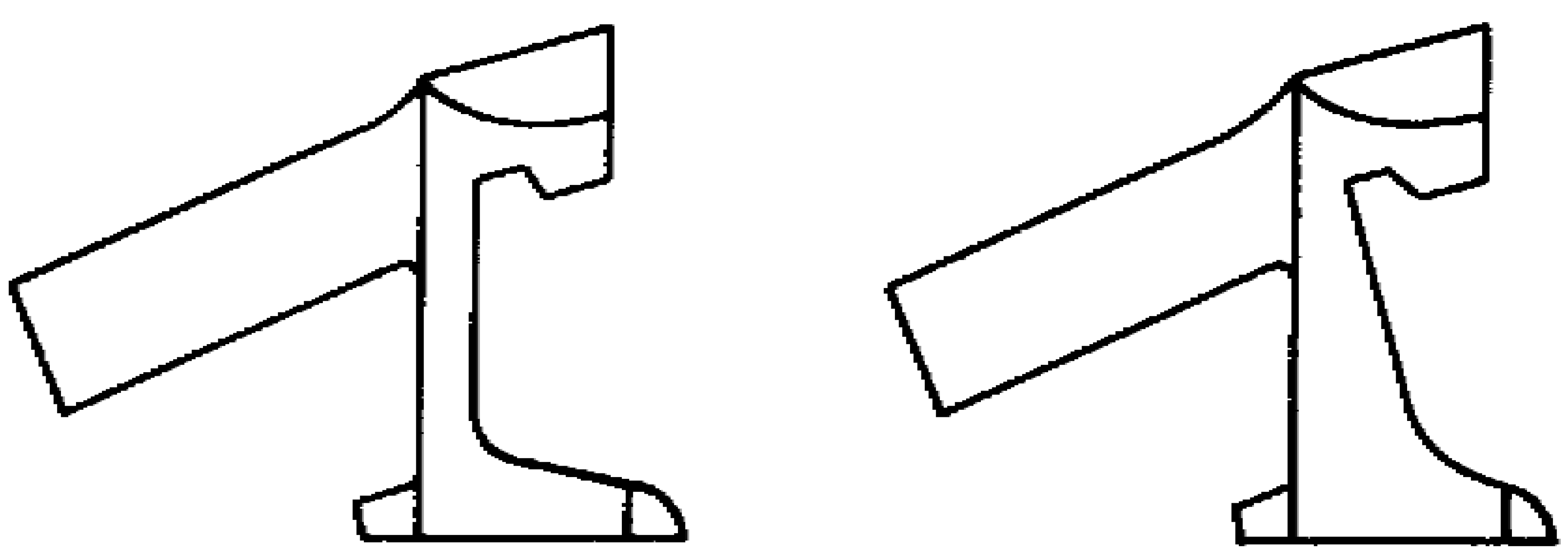


Figure 99. Recoil plate 5557150—old and new type (both types usable).

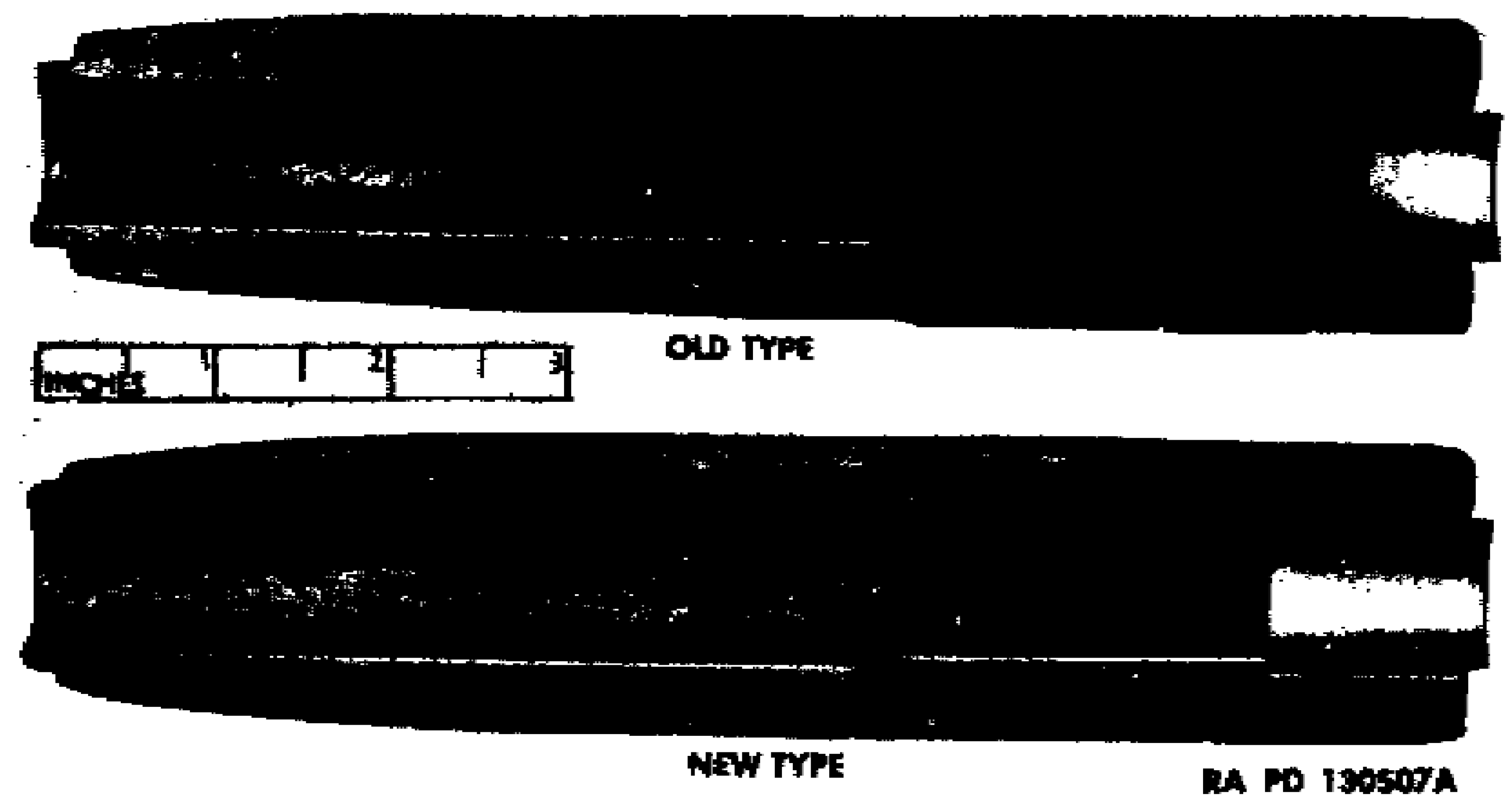


Figure 100. Hand guard assembly 6212602.

(2) Relieve friction due to swelling caused by excessive moisture only enough to allow proper functioning and/or assembly, as wood may later dry out and shrink. Use of raw linseed oil will help to prevent undue swelling of wood due to excessive moisture.

(3) Points to check for excessive friction or lack of sufficient clearance are—

(*a*) Aperture in stock for trigger housing (figs. 97 and 108). There must be a minimum of 0.010-inch clearance between stock and the rear of the trigger housing. Less than 0.010-inch clearance between stock and trigger housing causes the shock of recoil to be transmitted to the trigger housing retaining pin. This is especially detrimental in the case of the carbines M2 and M3.

(*b*) Left inside face of stock opposite head of hammer pin. This face may be scored because of an incorrectly assembled hammer pin.

(*c*) Point on right side of stock and hand guard where operating slide bar passes through to right side of receiver (fig. 96).

(*d*) Recess in bed of stock in which operating slide functions (figs. 98 and 107).

(*e*) Forward shoulder of stock and hand guard where front band seats (figs. 97 and 108).

(*f*) On the carbines M2 and M3 the left-hand side of stock where selector is located and the right-hand side of stock where disconnector lever assembly is located (fig. 98).

b. Loose Rivets in Hand Guard Liner. A loose hand guard liner (figs. 94 and 95) indicates improper spreading of the rivets. These

rivets are tubular; tighten them by spreading the hollow (inner) ends with a blunt punch. Support the opposite (beaded) end of the rivet while riveting. Place rivet head on a small steel rod or punch clamped in a vise.

c. Front Band Does Not Seat. If the front band does not seat properly behind the shoulder of the front band locking spring when assembled, the seating shoulders on stock or hand guard are not cut back far enough or the hand guard liner is too long. To remedy this condition, file the shoulders of stock or hand guard or both at the front sufficiently to allow proper seating and locking of band. Use a fine flat file with a safe edge and file rear face of shoulder only. Do not file the hand guard liner, for if it is too short the hand guard will fly off when firing the carbine.

d. Patching and Repairing Stock (DEPOT MAINTENANCE ONLY).

(1) *Dents.* Sand out dents or mutilations that do not affect strength or general appearance; use wood dough if practicable.

(2) *Cracks.* Components which are cracked in such a manner that strength is affected must be replaced. Where the strength is not affected, use repair screw A233523, or similar screw machined from brass to reinforce weak areas and small cracks. Drill an 0.081-inch hole to receive screw (fig. 102). Install screw by gripping it in chuck of a hand drill. Cut off screw and file flush with stock so that no edges protrude. Wherever possible dovetail patches in. In figure 101, the

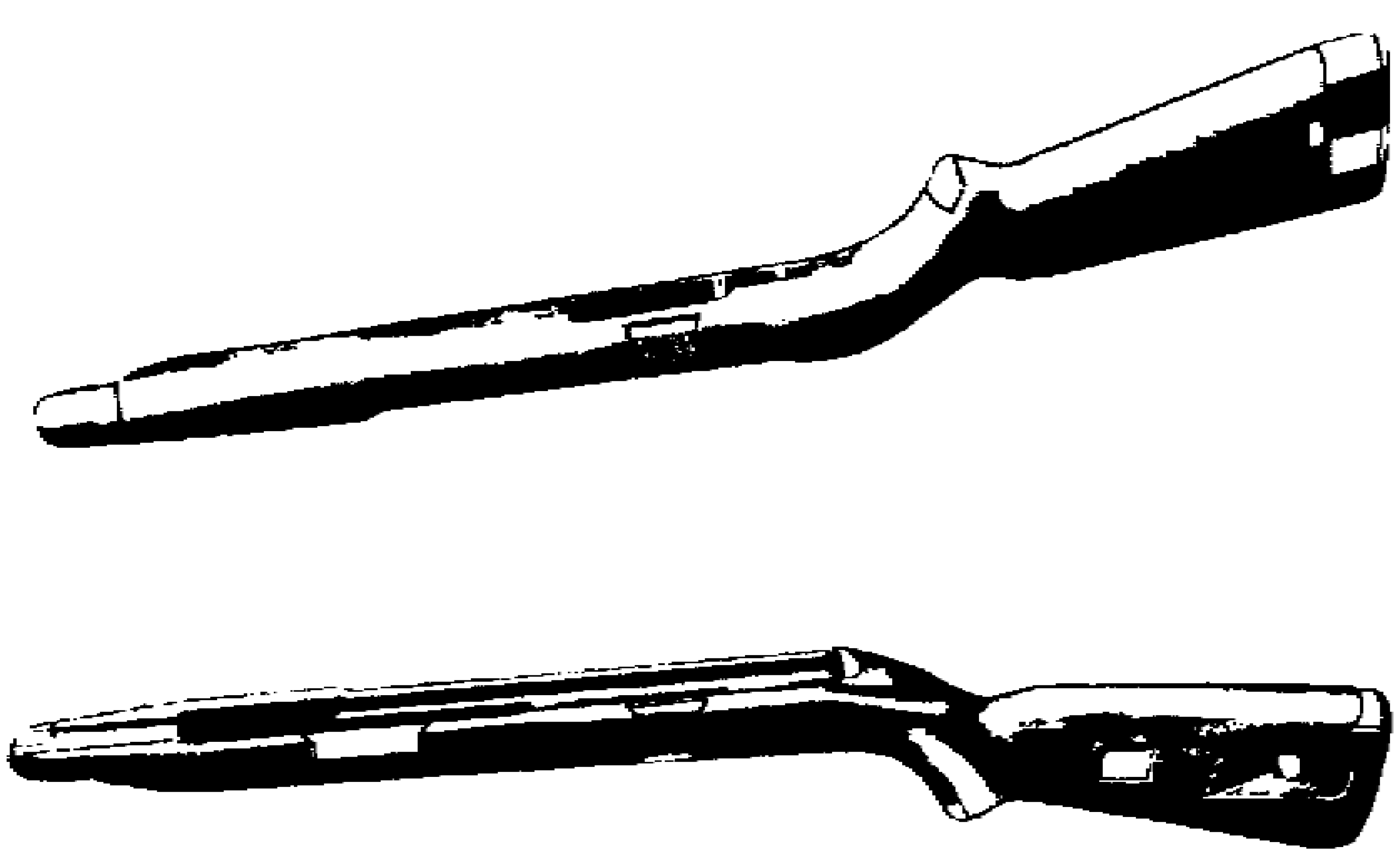


Figure 101. Patched stock.

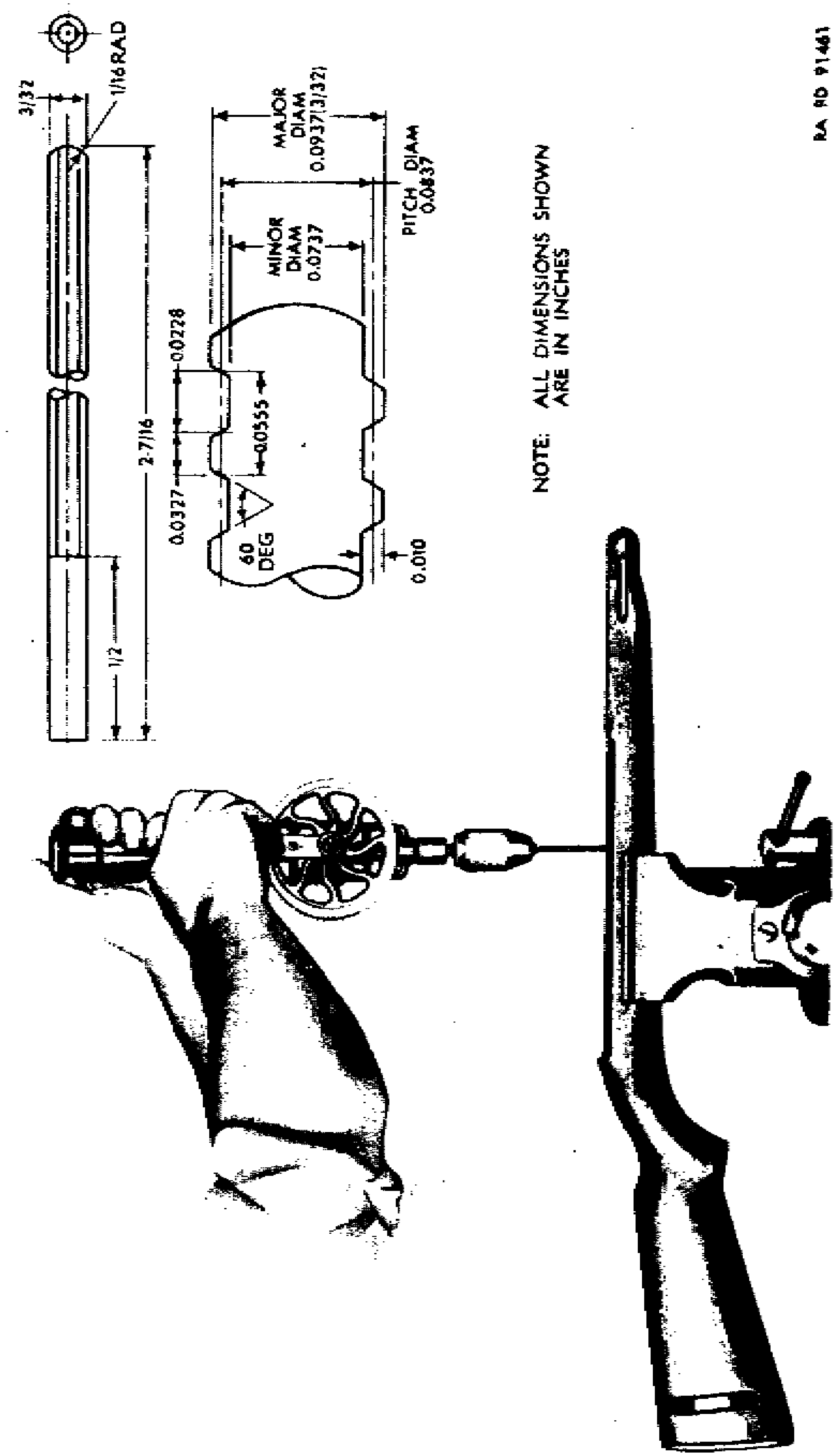


Figure 102. Installing repair screws.

light-colored patches show areas that may be patched and the method of inserting them in the stock; the dark-colored patches show areas that cannot be patched without weakening the stock.

(3) *Stripped thread for butt plate screw.* If the butt plate screw cannot be tightened properly due to stripping of threads in the stock, bore a hole of approximately one-half inch diameter in the stock to a depth approximating the length of the screw and obtain a ½-inch hardwood plug (hickory or walnut) which is a drive fit in the stock. Apply glue (adhesive—JAN–A–397) to the hardwood plug and the bored hole in the stock. Drive the plug into the bored hole (fig. 103).

e. Stock Modification. Carbine M1 stocks of stock assemblies C57157 of early manufacture were made with a thin section on the right side where the operating slide bar passes to the right side of the receiver. This thin strip should be removed in order to prevent cracks from starting in this area. The stock should be cut down as shown in figure 104.

63. Assembly

a. Front Band Locking Spring. Insert spindle of front band locking spring into hole in right forward end of stock and drive to the left. Seat spring fully in recess in stock.

NOTE: BORE OUT OVERSIZE (APPROX 3/8 IN.). GLUE AND DRIVE IN HARDWOOD DOWEL PLUG AND REBORE AND COUNTERSINK PROPER SIZE HOLE FOR BUTT PLATE SCREW.

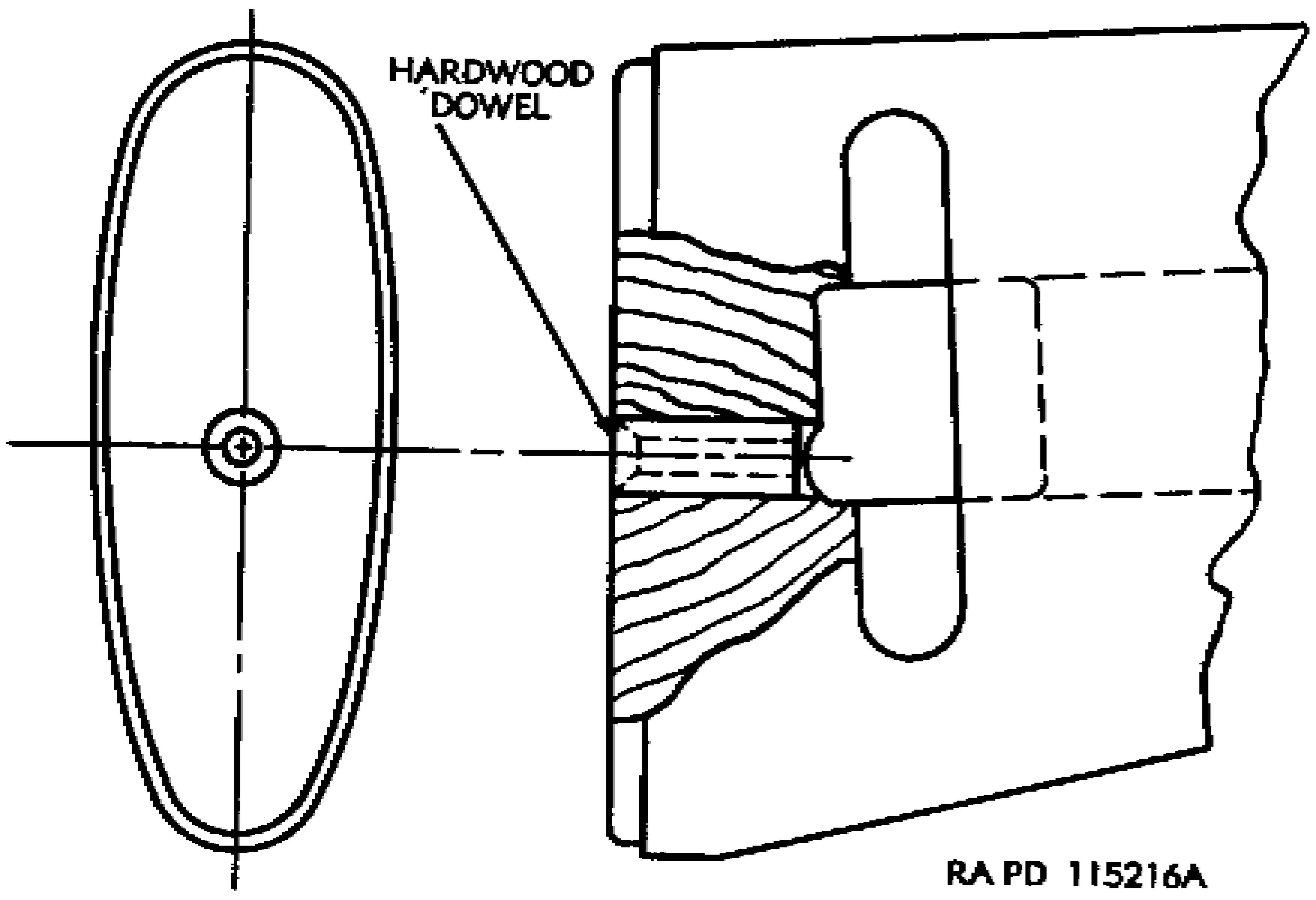


Figure 103. Repair for stripped screw hole.

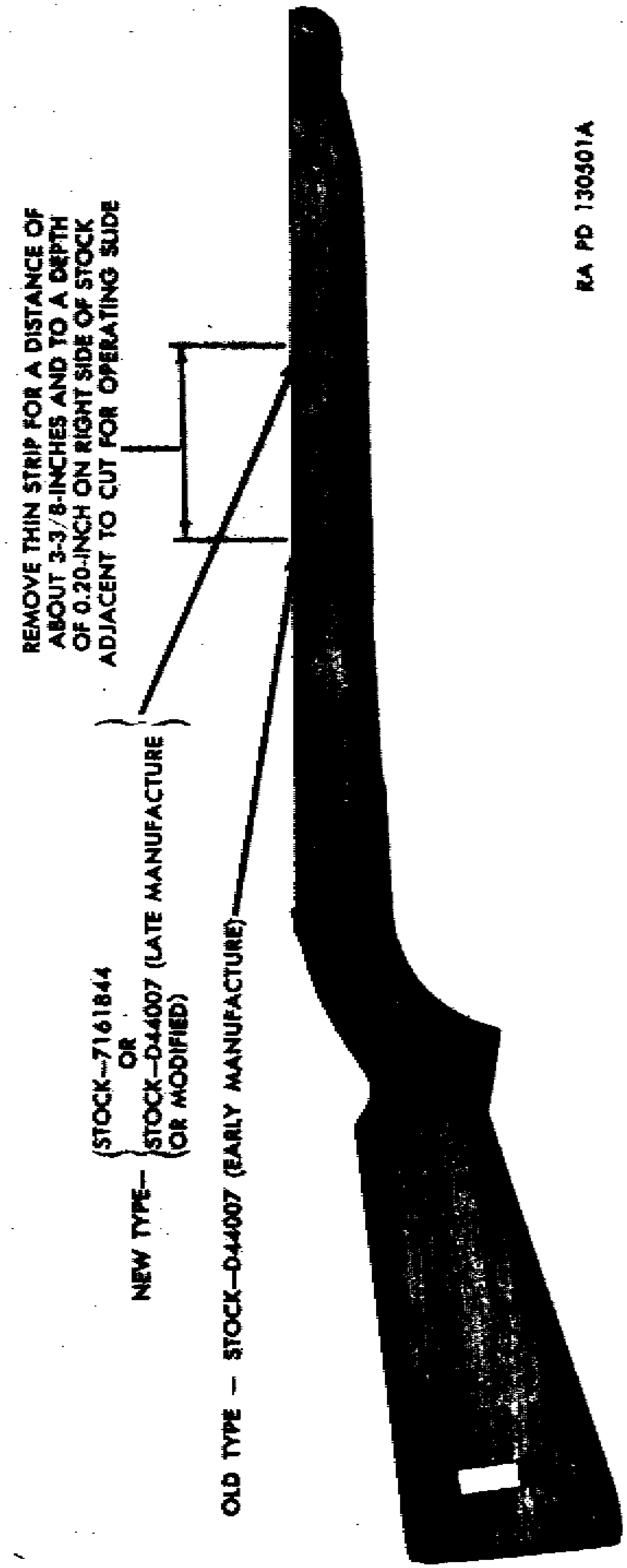


Figure 104. Modification of stock D44007 of early manufacture (carbine M1).

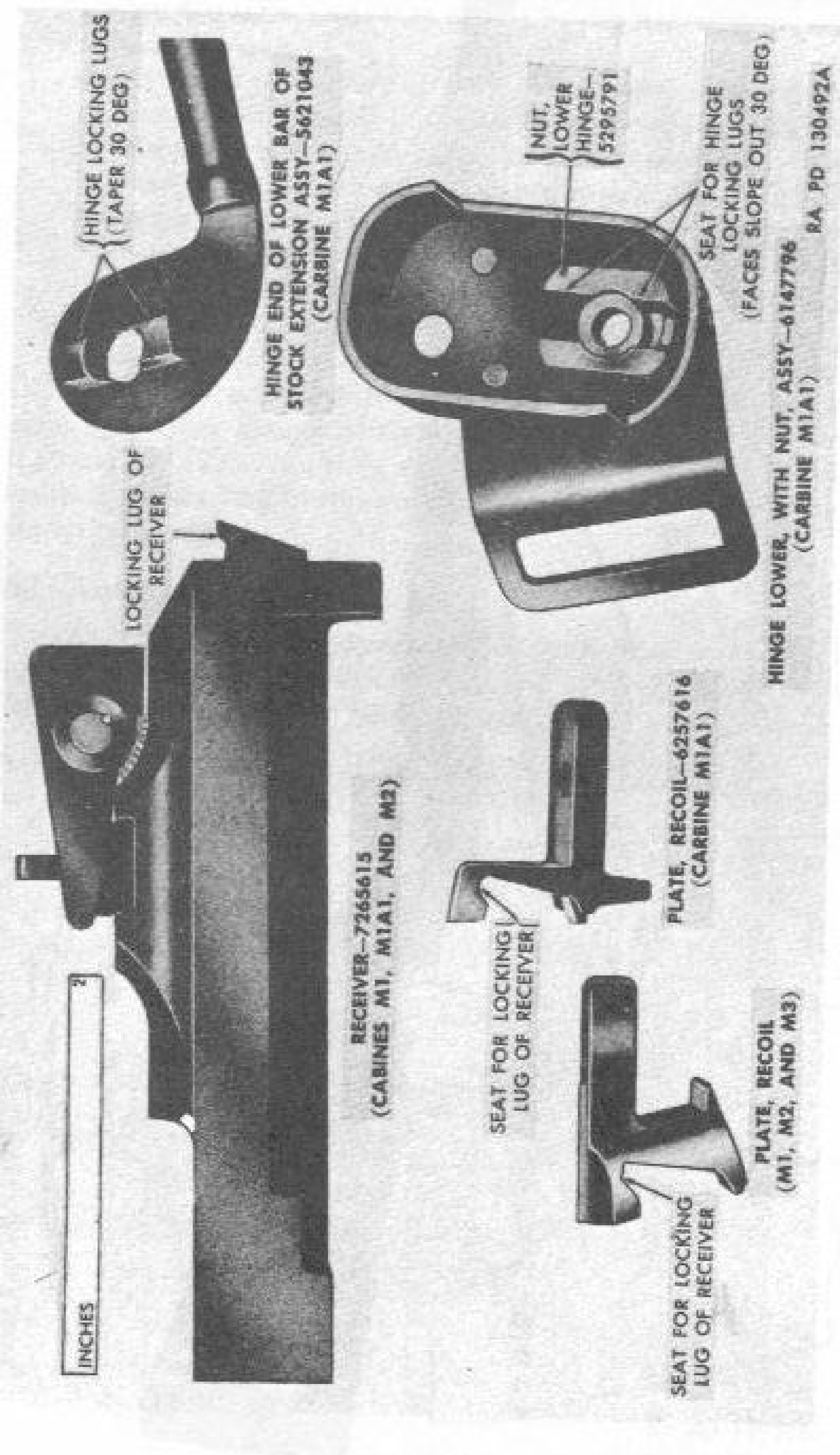


Figure 105. Important wearing surfaces.

b. Recoil Plate.

(1) If escutcheon has been removed, insert small end first in seat in lower face of stock grip. Tap in until seated level and flush with stock.

(2) Insert recoil plate into rear of receiver aperture in stock with bevel face up and tang to rear. Recoil plate must be inserted from front to rear and held level during insertion, so that seating lug and horizontal recess will mate. Seat recoil plate evenly and flush with recess in stock by tapping lightly. Install recoil plate screw through top of recoil plate and stock grip, thread into escutcheon, and draw down part way. Then assemble barrel and receiver group to stock, aline, and draw screw down tight. This prevents a strain on operating parts.

c. Butt Plate. Place butt plate on butt and tap lightly until solidly and evenly seated on butt. Insert screw and turn down snugly. Do not force screw as threads in wood of stock may strip.

Section XI. STOCK GROUP—CARBINE M1A1

64. Disassembly (Field or Depot Maintenance)

a. Stock Extension (fig. 106).

(1) Remove lower hinge screw from lower end of stock grip by turning counterclockwise.

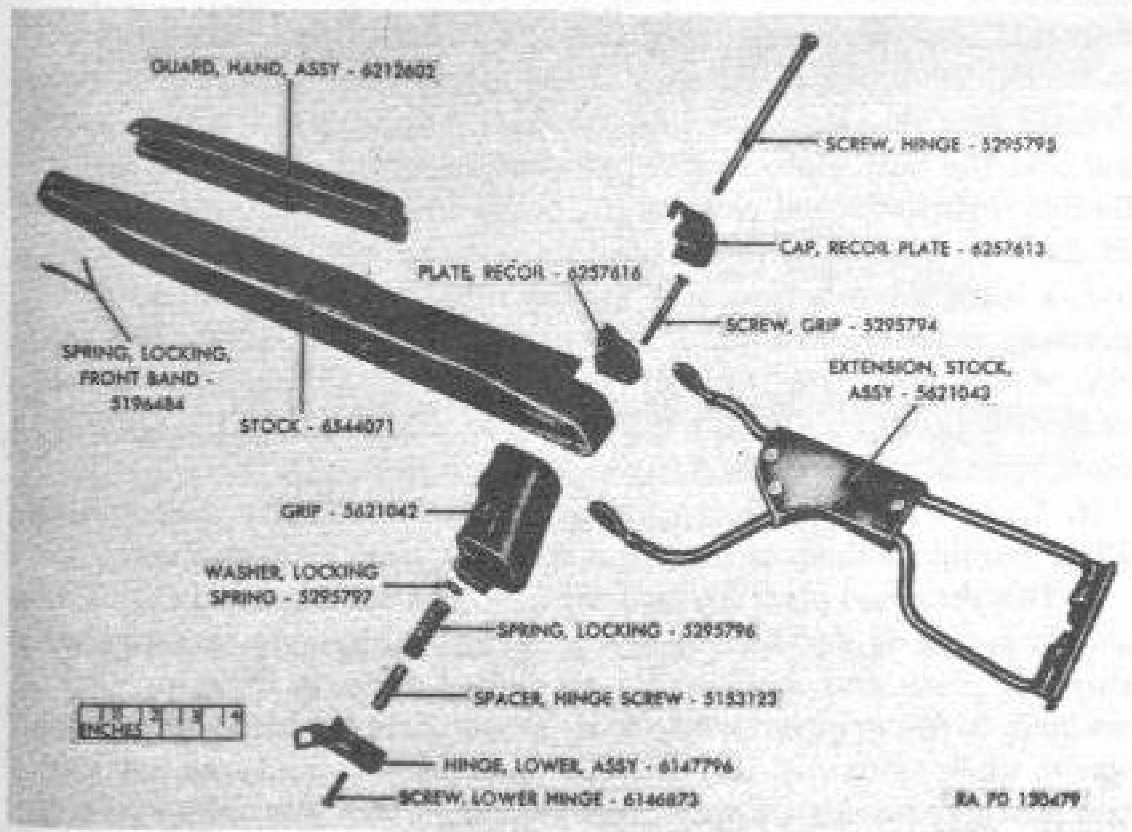


Figure 106. Stock assembly 6544072 and hand guard assembly 6212602 for carbine M1A1.

(2) With stock extension in extended position, unscrew the hinge screw projecting from the upper face of the recoil plate cap by turning counterclockwise. When screw is disengaged from the lower hinge nut, pull screw up and out of grip and then lift off recoil plate cap and lower hinge.

(3) With flat-ended punch, push hinge screw spacer out of hole in the lock on end of lower bar up into coil spring. Then pull stock extension to rear from stock and remove grip spring, hinge screw spacer and grip spring washer from countersunk hole in lower end of grip. Take care that spring does not fly out or washer does not become lost.

(4) Remove grip and recoil plate by unscrewing the grip screw counterclockwise from top of recoil plate.

65. Inspection

a. Inspect corresponding parts of stock as for carbines M1, M2, and M3 (figs. 107 and 108). Refer to paragraph 61.

b. Inspect grip for looseness on stock and for cracks. Grip should be rigid with stock and no twist should be possible when assembled.

c. Inspect stock extension for smoothness of hinge action and positive locking when extended and when folded. The extension should be rigid and without shake when extended with butt plate rigidly at right angles to the bars. When swung to the left, the lock should cam out of the slot in the locking nut, and the extension should pivot smoothly about the hinge screw through an arc of approximately 180° to lie flat against the left side of the stock. When the extension is pressed flat to the stock, the lock should slip into the slot in the locking nut and the butt plate should pivot on the bar ends, so that the extension will lie locked close to the stock without looseness or shake. If shake is present in either position, a worn locking lug or locking nut, a loose hinge screw, or a broken hinge spring is indicated. If pivoting is jerky, or binding is apparent, burrs on locking lug or in slot of locking nut or bent bars are indicated. If butt plate is loose on bars or fails to pivot under spring tension, burrs or a damaged butt plate spring are indicated.

d. Inspect recoil plate cap for dents and fit with rear end of stock. Plate should lie flush at the edges with the stock and receiver.

e. Inspect recoil plate for security and level seating on stock. Plate should seat level and firm on stock, held down by grip screw passing through plate and stock and into routed threads in grip. When assembled, the grip screw holds all three parts together. The hinge screw, when assembled and threaded into the nut, binds the parts still tighter and prevents the grip from twisting.

f. Inspect receiver locking lug seat in recoil plate for wear and burrs (fig. 105). When assembling, the locking lug on receiver should

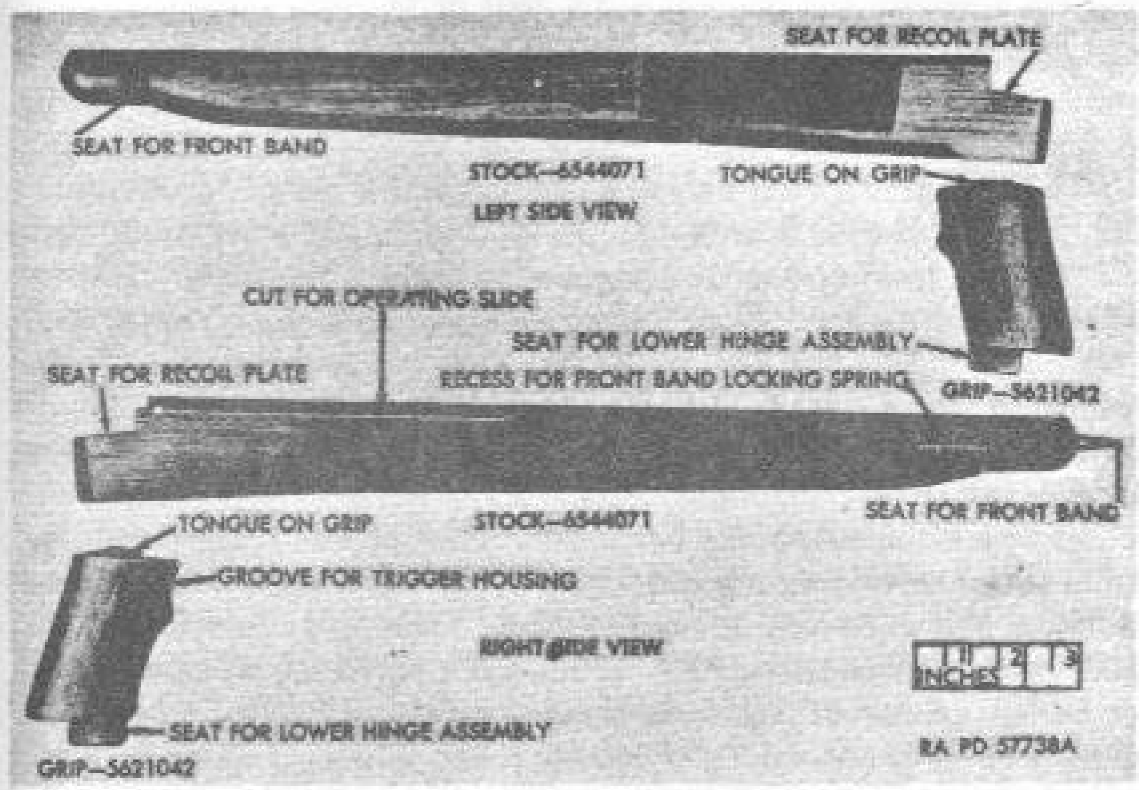


Figure 107. Stock and grip for carbine M1A1.

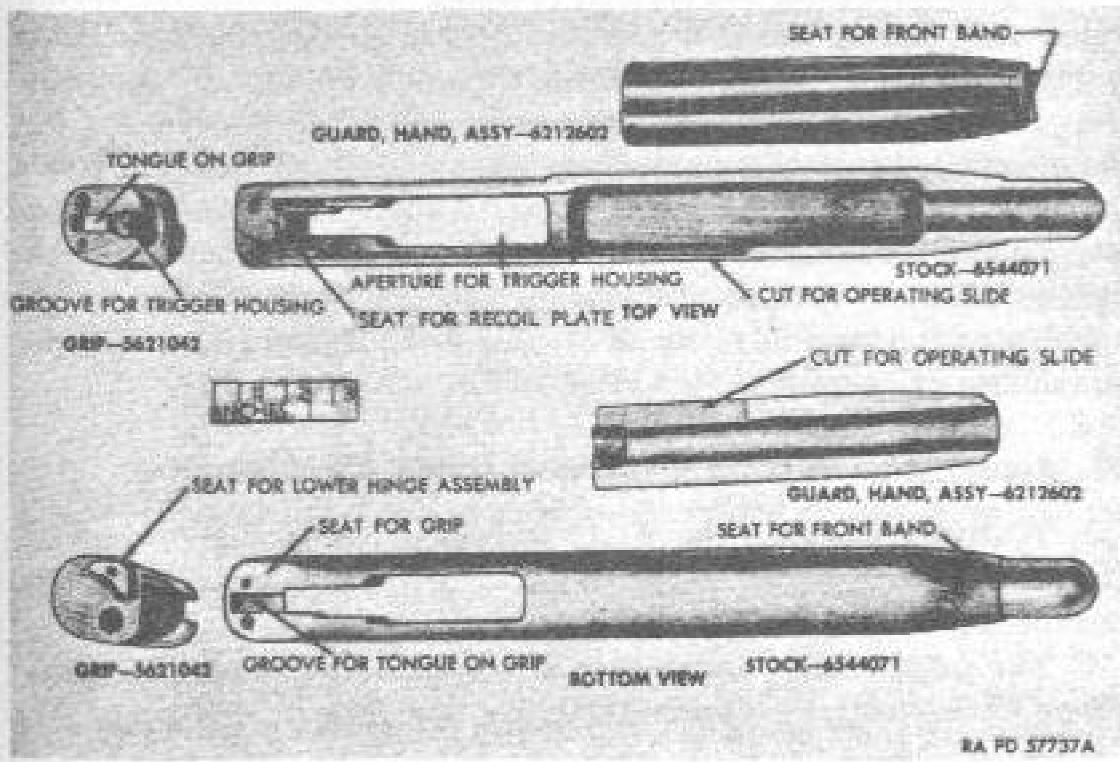


Figure 108. Stock, hand guard, and grip for carbine M1A1.

cam smoothly into the seat and be held there snugly without play or shake.

g. Inspect grip screw for length and burred threads. Replace the 2$\frac{9}{32}$-inch grip screw by a 2$\frac{3}{4}$-inch screw. If screw has not been replaced, deepen grip screw hole to a total depth of 1.125 inches with

a No. 21 drill (diameter 0.159 inch). Inspect routed threads in grip for wear and stripping. Screw should turn in snugly to retain recoil plate and grip. If screw is loose, routed threads will eventually strip out and grip will twist loose.

h. Inspect grip spring washer and hinge screw spacer for deformation. Spacer should fit in hole in lock on lower bar when assembled.

i. Inspect locking nut for looseness in lower hinge shell. Inspect shell for deformation. Inspect sling eyelet for looseness on hinge shell (fig. 105). (Nut is staked or spot-welded in shell and eyelet spot-welded to shell.) Check locking slot in nut for wear and burrs (angle of slot face is 30°). Inspect lower hinge screw for wear and inspect threads in grip for stripping.

j. Inspect hinge on upper bar for deformation and cracked welding and lock on corresponding end of lower bar for deformation, cracked welding, and worn locking lug (fig. 105). The proper mating of lock and nut determine the rigidity of the stock extension when extended or folded. Angle of lock faces should correspond to that of the nut. Wear of lock or nut will cause looseness and improper locking.

k. Inspect bars for deformation. They should lie in the same vertical plane when assembled.

l. Inspect butt plate for smooth pivoting on rod ends, for spring action with spring assembled, and for cracks. Inspect butt plate spring for tension, excessive deformation, and broken or bent ends.

m. Inspect cheek rest plate and retaining plate for deformation and looseness with each other on the bars when assembled. Inspect rivets for looseness and protrusion of heads. Inspect cheek rest cover for scoring and cracking of leather. Cheek rest plate should be held tightly to bars by retaining plate and rivets, and leather cover, on the stock extension assembly (fig. 106), should be smooth, so it will not scrape face of operator.

66. Repair and Rebuild (Field and Depot Maintenance)

a. When the stock for the M1A1 carbine is irreparable or unavailable, it is to be replaced by the standard type stock assembly for the carbine M1.

b. For maintenance and repair of wooden components, see paragraph 62 covering the carbines M1, M2, and M3.

67. Assembly

a. Stock. For items that correspond to the carbines M1, M2, and M3, see paragraph 63.

b. Stock Extension.

(1) If the grip and recoil plate have been removed, replace them by fitting grip to rear, under face of stock, just behind trigger guard opening so that projection on grip points downward and trigger guard bow will fit into forward face of grip when assembled. Seat the recoil plate on top of rear end of stock with undercut lug facing forward. Aline screw holes in plate and stock, insert grip screw and screw down tightly, turning clockwise to secure recoil plate, stock, and grip firmly together.

(2) Place grip spring washer in large counterbored hole in lower end of grip and seat grip spring in hole upon washer. Then grasp stock extension so that locking lug on lower bar faces downward and place upper face of lock against lower end of grip spring. Hold in position firmly and press upward on lock against spring pressure until hinge on upper (straight) bar will slip over and lie upon top of recoil plate. Still holding lock in position with regard to spring, aline hole in spring and lock, and insert hinge screw spacer until flush with lower face of lock.

(3) Position recoil plate cap over recoil plate and upper hinge so that it rests flat on hinge and recoil plate. Insert hinge screw through hole in cap and push downward through hinge, recoil plate, stock, grip, grip spring washer, grip spring, spacer, and lock on lower bar. Be sure screw is pushed down until upper shoulder on screw has entered the hole in upper hinge and is not bearing on cap, or top of hinge.

(4) Position lower hinge assembly over lock so that locking lug slot in nut will mate with locking lug on lock and sling eyelet faces forward. Then, press nut and lock upward against force of grip spring and turn hinge screw until threads on hinge screw catch threads in nut. (Be sure spacer is flush with lower face of lock before attempting to catch threads.) Turn screw so that nut pulls lower hinge upward until lower hinge shell is resting firmly upon lower face of grip.

(5) Insert lower hinge screw in lower end of stock grip and turn in clockwise direction until tight. Then fold stock extension to left against stock to test locking. Stock extension should be locked rigidly when fully extended and when fully folded. Butt plate should turn on the rod ends to lie flat on stock when extension is folded. When extension is extended, butt plate should spring out and lie firmly in a plane at approximately right angles to the bore line. The perpendicular line of butt plate will be slightly to left of bore line when stock extension is extended. Be sure there is no movement between stock and grip.

Note. When folding-type stock assembly for carbine M1A1 is irreparable or unavailable, it will be replaced by standard type stock assembly for carbines M1, M2, and M3.

68. Disassembly

a. Grasp magazine in left hand with base up and rounded face toward the body (fig. 109). With left thumb, press up on forward (rounded) end of magazine base until the base can be slid out of its retaining grooves in the base of body. Movement can be started by inserting rim of cartridge or point of screw driver in indent in top of base. Restrain magazine spring as base is removed and withdraw from tube. (Bases of recent design are ribbed on the inside for stiffening and have an overhanging lip on the round end. Such bases can be removed by inserting screw driver under lip and pulling up and out.)

b. Reverse tube and slide follower to bottom of tube; then, grasp long rear flange of follower and rotate down out of tube.

c. If follower sticks in tube, insert screw driver or similar tool from top of tube to bear on rear end of follower and press on follower until stop flange is clear of tube. If flange will not rotate out, press up on opposite end to assist rotation. Do not force. Grasp flange and rotate follower out of tube.

d. Do not disassemble the magazine except for cleaning or salvage. Early type magazine tubes had a lip on the lower rear wall of the tube which often necessitated removal of the follower as in *c* above.

69. Inspection

a. Tube. Inspect lips of tube for deformation, dents, and burrs. Inspect retaining lugs on rear face of tube for wear and burrs and base retaining flanges for deformation and retention of base. If lugs on rear face of tube are worn to the extent where proper retention is doubtful, scrap the magazine.

b. Base. Inspect base for retention in tube, deformation, and worn retaining protrusion.

c. Spring (figs. 110 and 111). Inspect spring for deformation, fracture, and set.

d. Finish of Metal. Refer to TB ORD 366.

70. Assembly

a. Insert short curved flange of follower into rear (flat side) of bottom opening of magazine tube and rotate long flange upward into tube.

b. If lip is present on tube, press down on opposite end of follower and rotate until end of long flange snaps under lip of tube. If necessary, insert screw driver or similar tool into top of tube to hold short end and assist in rotation. Do not force unduly or magazine will be distorted. (Recent design follower rotates easily into tube.)



Figure 109. Removing magazine base and follower.

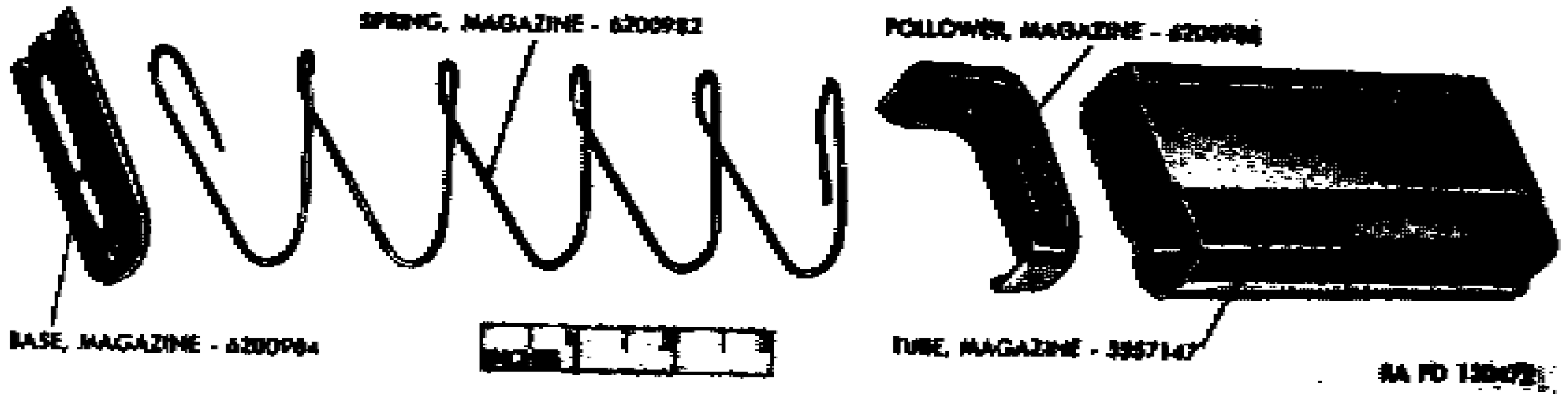


Figure 110. Magazine, 15 round—exploded view.

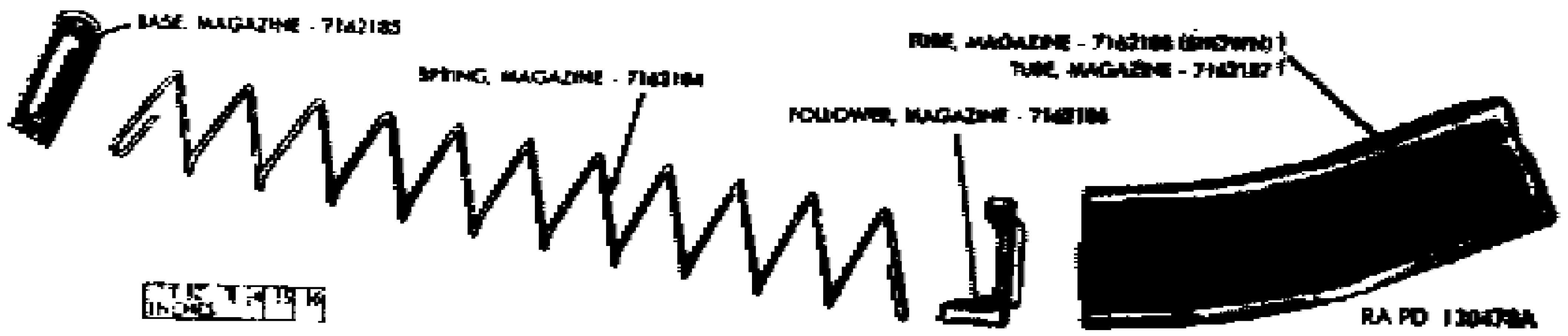


Figure 111. Magazine, 30 round—exploded view.

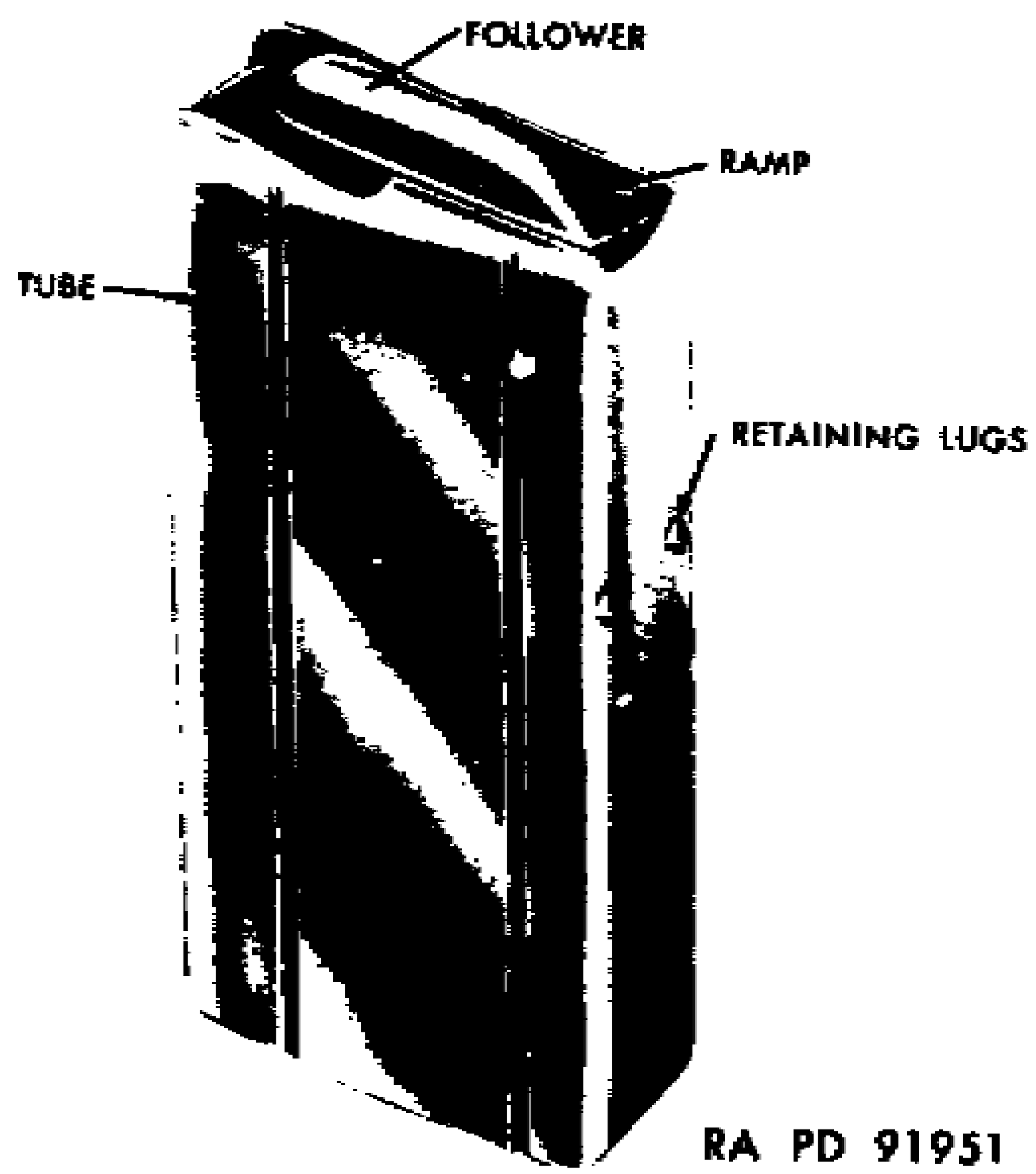


Figure 112. Follower properly assembled.

c. Push follower to top of tube and insert magazine spring with long dimension to the rear as shown in figure 110. In this position the follower will slide evenly in the tube. Compress spring with thumb, and starting from the rounded edge of tube, insert the base, square end first, with projection of indent facing in, under retaining lips of tube. Push base in until projection catches on tube. Push follower down in tube and release to test smoothness of functioning. If follower does not reciprocate smoothly under spring action, tube or follower is distorted and should be corrected. (Magazine base of recent design is ribbed for stiffening. Ribs should face inward when base is assembled.)

d. When assembled correctly, the ramp on the follower must be facing the rear of the tube. The rear of the magazine tube is flat and has two lugs for engaging the magazine catch (fig. 112).

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CHAPTER 5

FINAL INSPECTION

71. General

Weapons turned in for repair may be assumed to have defects caused by use or neglect. When they were accepted as new weapons, the parts composing them were dimensionally correct and made of the proper material. Consequently, the inspection of these weapons after repair will differ from the inspection procedure used in the manufacturing plant in that attention will be directed to wearing surfaces, parts that might crack or break due to high stress or fatigue, and evidence of corrosion. These defects do not evidence themselves by uniform reduction in a given dimension but show up as a chipped edge, a partially worn surface, or an eccentric hole. A gage used in manufacturing is merely means of comparing an unknown dimension with a known one to judge whether a piece comes within tolerances. After a piece is worn through use, the change in dimension is more easily detected in many cases by comparing with adjacent surfaces; the piece in itself becomes a gage. Visual inspection, therefore, is far more applicable in these cases and gaging is limited to those dimensions that are critical and that may be advantageously measured rather than compared. Inspection of noncritical parts (parts that do not cause malfunctions) is limited to appearance and the presence of cracks or flaws. The dimensions placed on these parts (and gaging used during manufacturing) were for the sole purpose of insuring interchangeability. Even if the dimensions of such parts are worn considerably below drawing tolerances, functioning and interchangeability will not be adversely affected and the parts are consequently acceptable.

72. Inspection Guide

Table III is a check list for inspection of the carbines in the hands of troops and is applicable to check points of inspection for return to user and for return to stock.

73. Return to User

a. Carbines are not to be considered unsuitable for oversea use because of lack of modification unless such modification affects the safety

of personnel, is essential to the functioning of the weapon, or is prescribed by an URGENT modification work order.

b. Newly manufactured and issued matériel, which has been inspected and accepted in accordance with Department of the Army specifications, is not to be rejected except for well-grounded reasons. All such rejections must be reported immediately to higher authority.

c. Satisfactory metal finishes for weapons range from dense black to medium light gray. Certain small-arms weapons are manufactured with an unusual shade of neutral gray finish. Since this finish (gray zinc phosphate) is an accepted Department of the Army standard, these weapons are not to be rejected by inspectors or troops for this condition. A worn surface is objectionable from the standpoint of visibility when it is capable of reflecting light, somewhat as a mirror does. No weapon is to be rejected for oversea use unless exterior parts have a distinct shine. Bright rear sights must not be permitted on weapons for oversea use. Check to see that all rear sights have a dull black or gray finish on all surfaces.

d. Wooden components must not be cracked in such a way as to interfere with their structural strength. Surface cracks, bruises, or dents which do not affect their strength should not cause rejection.

e. Inspection of the barrel to determine that it meets the requirements for return to user is similar to the inspection of the barrel required for return to stock which is described in TB ORD 366.

f. Looseness and play in such components as the sight, gas cylinder, recoil plate, bolt, may be cause for rejection. In many cases, however, the importance of such defects is exaggerated. Looseness and play must be considerable to affect the accuracy of a weapon beyond its natural dispersion. All weapons, especially those that are automatic, must have play between working components to permit them to operate in localities where sand and dust are prevalent. A weapon may be completely useless if its working parts are fitted with insufficient clearance.

g. Minor defects in metal components do not normally affect their being acceptable. Scratches and tool marks on barrels are ordinarily of no importance.

h. Inspect the functioning and operation of components as described in paragraph 15.

i. Check to see that serial number on receiver is plainly visible (par. 58*e*).

74. Return to Stock

Refer to TB ORD 366 for these inspection instructions.

CHAPTER 6

REBUILD STANDARDS

75. General

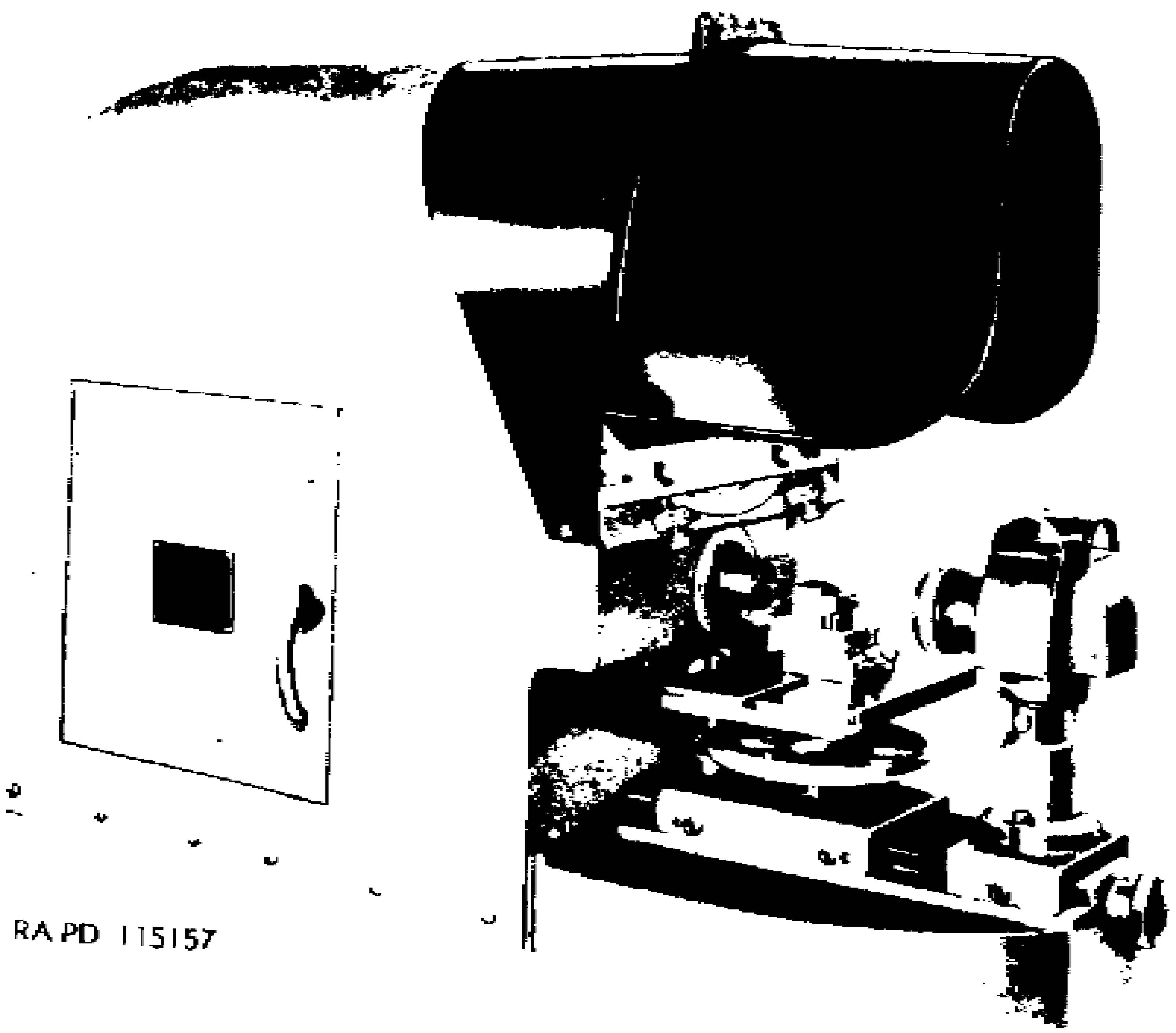
Refer to TB ORD 366 for general rebuild standards.

76. Use of Comparator

In those permanent depot maintenance establishments where facilities are available, the trigger, hammer, and sear are to be inspected on a comparator.

a. A comparator is an optical projection machine for measuring or comparing objects by means of a magnified shadow on a translucent screen.

b. The bench comparator (fig. 113) used for the inspection of trigger, hammer, and sear of the .30 caliber carbines M1, M1A1, M2, and M3 is intended for comparison inspection of the parts against a chart which is placed over the screen. The shadow projected upon the screen is a reverse image of the part being inspected.



RA PD 115157

Figure 113. Bench optical comparator.

77. Comparator Optical System

The functions of the various components of the optical system are as follows:

a. A 50-candlepower projection lamp (fig. 114) is used as a source of light and receives power through a transformer or resistor.

b. A condensing lens assembly (fig. 115) directs a concentrated, parallel beam of light across the object.

c. An iris diaphragm (fig. 115) controls the size of the light beam.

d. A projection lens (figs. 116 and 117) projects an enlarged shadow image of the object.

e. An optically flat reflecting mirror (figs. 116 and 118), coated with aluminum oxide, reflects the shadow image of the object onto the translucent screen (fig. 114).

f. The translucent screen (fig. 114) which receives the shadow image.

g. Glass gaging charts (fig. 119), with limiting dimension lines inscribed, are placed over the screen for comparison inspection of the proposed image. The following information also can be found on them.

(1) Identifying nomenclature—in the upper left-hand corner.
(2) Instructions for use.
(3) Magnification needed—in the lower right-hand corner.

78. Mechanical Description of Comparator

a. The staging table (fig. 114) has an over-all length of 10 inches. It is provided with a focusing and vertical adjustment (fig. 116) but no lateral adjustment.

b. Staging fixtures 7319701 (figs. 11 and 119) can be moved laterally across the staging table and are self-alining.

(1) Each staging fixture is provided with a tongue (fig. 119) which engages a guide groove in the staging table top and guides the fixture as it is moved laterally across the table.
(2) Each fixture is equipped with a quick acting, hold-down clamp (fig. 119).

c. Lens height above staging table varies from a maximum of 3 inches to a minimum of 1⅜ inches.

d. Bench space required by the comparator is 16x44.

e. Net weight of the comparator is 475 pounds.

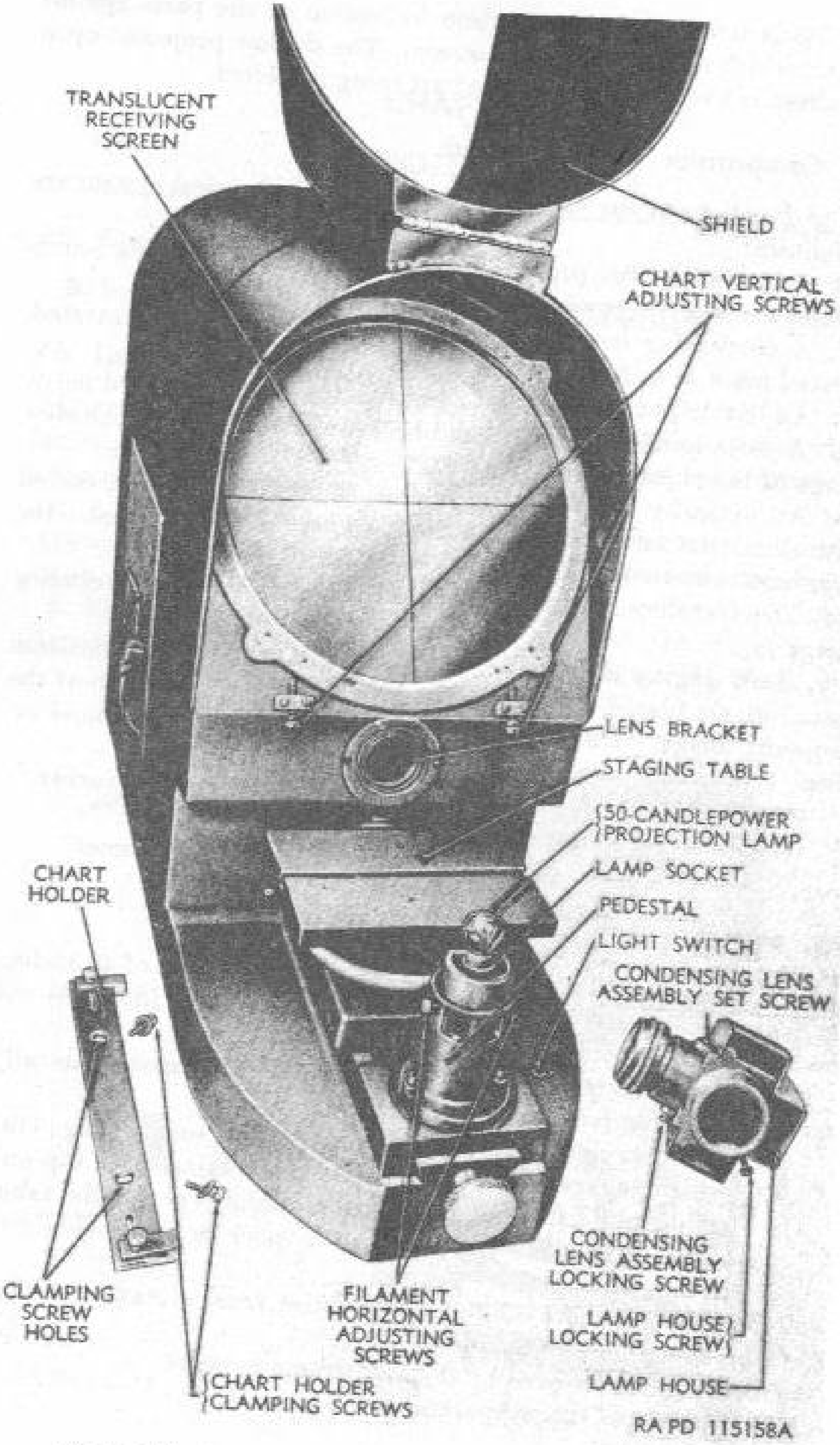


Figure 114. Comparator—chart holder and lamp house removed.

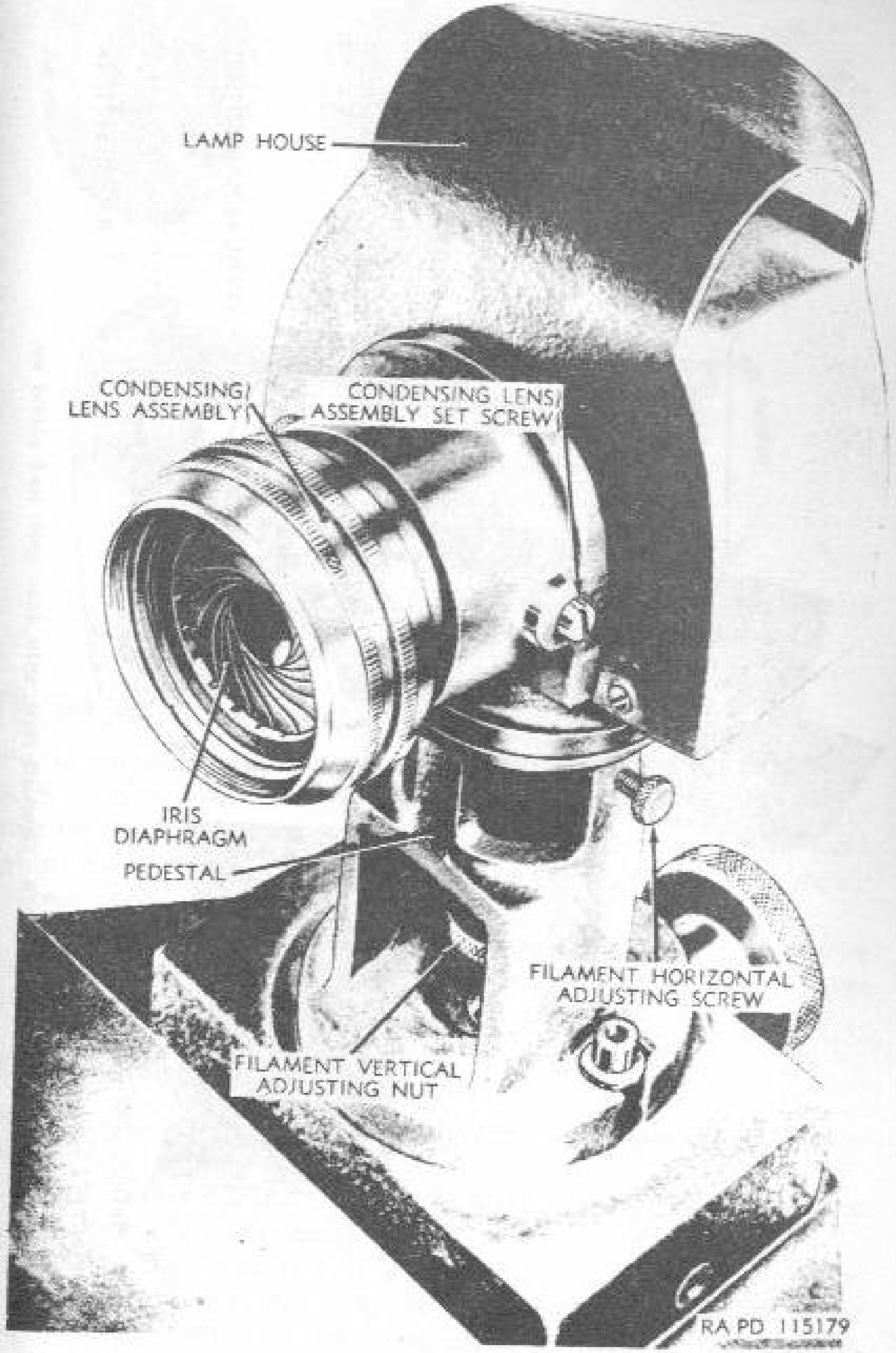


Figure 115. Pedestal and lamp house assembly.

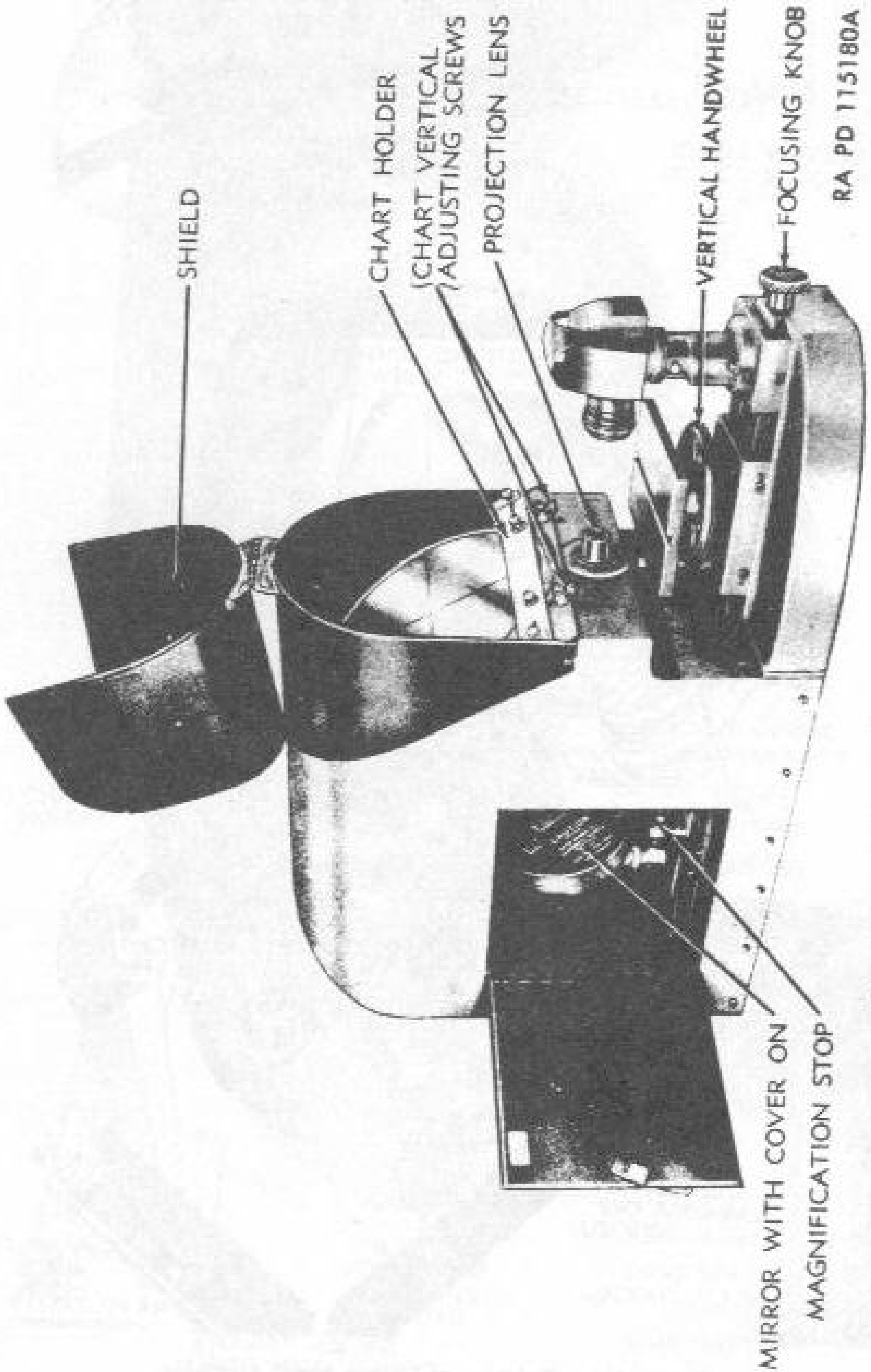


Figure 116. Over-all view with door open and shield up.

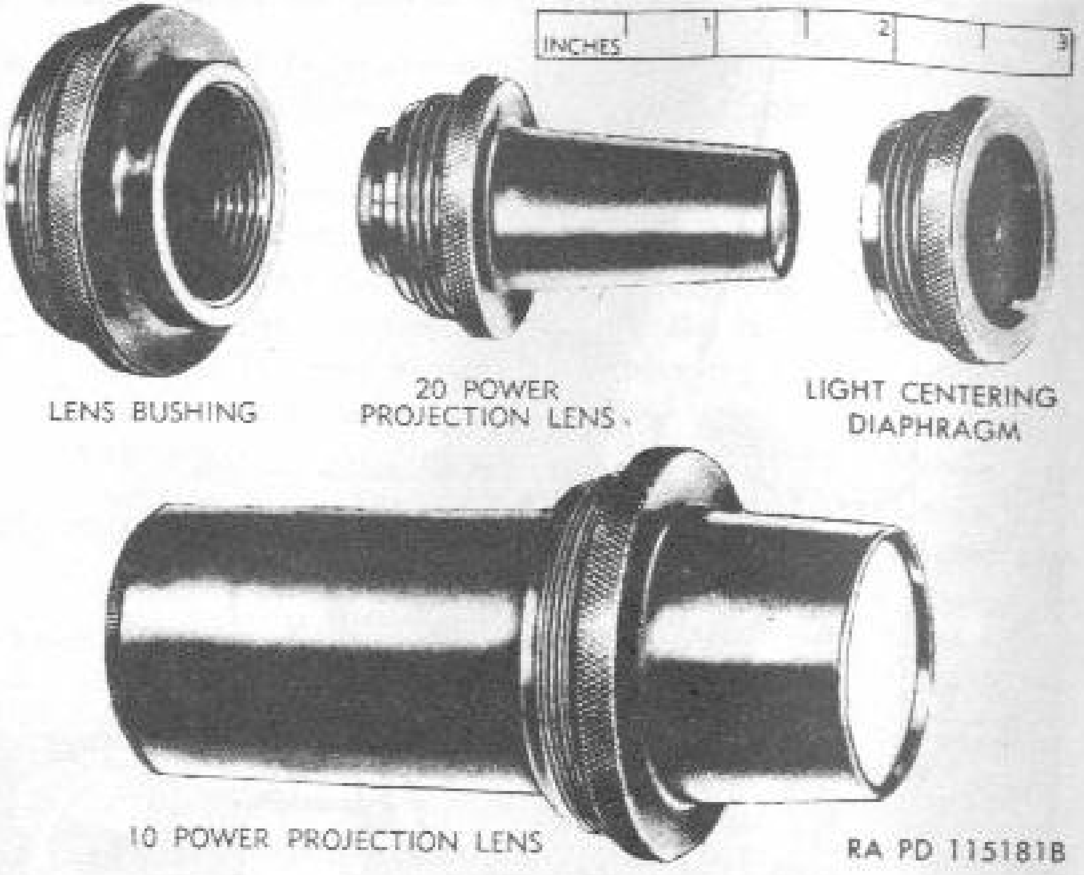


Figure 117. Lenses and optical system accessories.

79. Set-Up Instructions for Comparator

a. Comparator may be used under ordinary shop lighting conditions. It is desirable, however, that the operator face no light stronger than the illumination on the chart, and that there be no strong light behind the operator to dim the shadow on the chart and thus impair contrast and sharpness of definition.

b. The base of the machine has a three-point bearing. It should be put on a sturdy bench or table in a location comparatively free from vibration.

80. Assembly of Comparator

a. Place the projection lamp into the lamp socket and place the lamp house on the pedestal (fig. 114).

b. The mirror assembly should be unwrapped carefully and the mirror cover (fig. 116) removed.

Caution: Do not touch face of mirror.

c. Insert the lens bushing (fig. 117) into the lens bracket (fig. 114).

d. Place the translucent receiving screen 7317838 (fig. 114) into the recess in the hood.

e. Clamp the chart holder in place over the screen with the clamping screws as shown in figure 114.

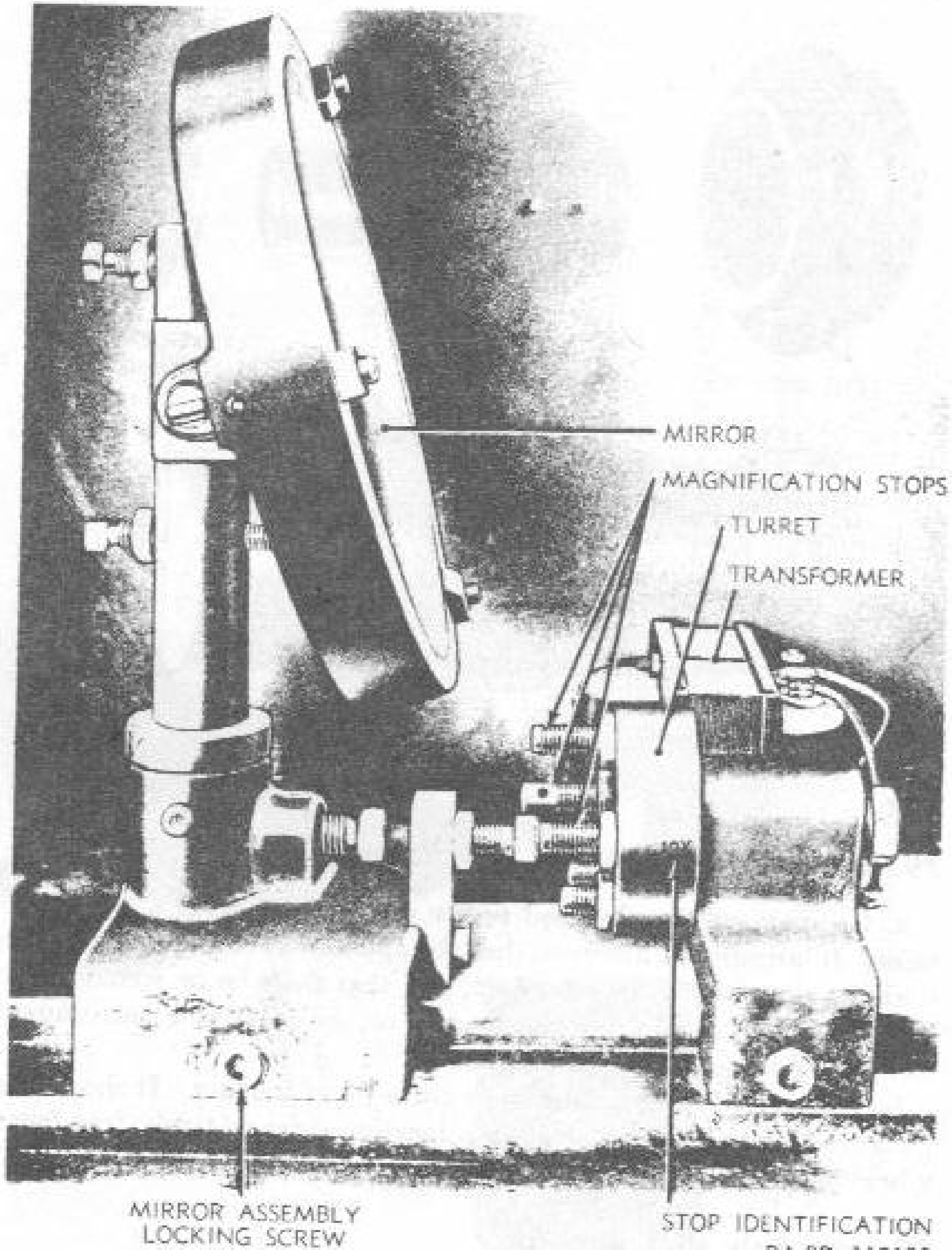


Figure 118. Mirror and turret with magnification stops.

f. Connect switch cord to convenient light socket.

Caution: The line voltage must be 110 volts at 60 cycles, as specified on the name plate at the rear of the comparator; otherwise, the transformer (fig. 118) may be burned out.

g. Turn on the light switch (fig. 114).

81. Adjustments of Comparator

a. Alinement of Light Beam Centrally With the Projection Lens.

(1) Insert the light centering diaphragm into the lens bushing (fig. 117).

(2) Swivel the lamp house assembly (fig. 115) to locate the image of the filament near the center of the screen horizontally.

(3) Adjust the condensing lens assembly (fig. 115) forward or back to get a projected image of the lamp filament on the screen. In order to move the condensing lens assembly as required for this adjustment loosen the condensing lens assembly (knurled) locking screw (fig. 114) and slide the condensing lens assembly. Do not loosen the condensing lens assembly set screw (fig. 115) on the left side of the lamp house nose. The set screw projects into a groove in the condensing lens assembly guide, limiting forward and rearward positions of the assembly and also preventing any axial movement of the condensing lens assembly.

(4) Check the vertical location of the image of the filament for alinement through the optical system to the screen. Turn the knurled diaphragm body clockwise until the iris diaphragm (fig. 115) is closed to its smallest opening. If the projection lamp filament is properly positioned vertically, the image of the filament received on the screen will be located centrally with respect to the vertical dimension of the shadow perimeter of the iris opening appearing on the screen.

(5) A secondary check, that the projection lamp filament is properly positioned vertically, is to note the vertical position of its image on the face of the light alining diaphragm with respect to the small hole.

(6) To alter the adjustment of the filament vertically, loosen the two filament horizontal adjusting screws (figs. 114 and 115), and adjust the projection lamp vertically by use of the (knurled) filament vertical adjusting nut (fig. 115) in the base of the lamp house pedestal.

b. Alinement of Light Beam Centrally With the Receiving Screen.

(1) Loosen the condensing lens assembly (knurled) locking screw (fig. 114) on the right and the condensing lens assembly set screw (fig. 115) on the left side of the lamp house nose and remove the condensing lens assembly from the lamp house.

(2) Move the projection lamp assembly horizontally by use of the two filament horizontal adjusting screws located under the lamp house until a small, light, clear image of the filament appears in the center of the screen with respect to the horizontal dimension of the screen.

(3) Insert the condensing lens assembly into the lamp house and tighten the set screw on the left side of the lamp house nose until the set screw projects into the guide groove.

(4) Open the iris diaphragm by turning the knurled body counterclockwise and move the condensing lens assembly to bring the image of the filament into sharp focus.

(5) Swivel the lamp house assembly to locate the image of the lamp filament in the center of the screen with respect to the horizontal dimension of the screen. Tighten the lamp house locking screw (fig. 114) against the pedestal to hold the lamp house in this position.

(6) Adjust the condensing lens assembly (a(3) above) forward or back until an approximately parallel beam of light is produced from the condensing lens to the projection lens system. This condition may be checked readily by interposing a white card between the light centering diaphragm and the condensing lens. First place the card near the light centering diaphragm and then place the card near the condensing lens. The area of illumination on the card at either location will be approximately equal in diameter when the light beam is approximately parallel.

(7) For a final check of alinement, again close the iris diaphragm to its smallest opening. If the alinement is correct, the image of the lamp filament received on the screen will be centered both vertically and horizontally in the shadow perimeter of the iris opening appearing on the screen. In turn, the shadow perimeter of the iris opening should in itself be located centrally with respect to the horizontal dimension of the screen.

(8) Remove the light centering diaphragm and replace with the projection lens intended for use in the comparator.

(9) Open the iris until the illumination on the screen is distributed evenly. The sharpness of the shadow definition can sometimes be improved by varying the size of the opening of the iris diaphragm.

c. Adjustment of Mirror to Obtain Proper Magnification.

(1) The comparator is equipped with a complete set of magnification stops located in a small turret (figs. 116 and 118) just inside the door. A 10-power and a 20-power projection lens (fig. 117) is supplied with the comparator and each projection lens has its corresponding magnification stop. Each stop has the magnification, corresponding to the magnification of the projection lens stamped adjacent to it on the turret.

(2) Adjustment consists of locating the mirror assembly with respect to the proper magnification stop.

(3) To move the mirror assembly, loosen the mirror assembly locking screw (fig. 118) with a 5/16-inch socket-head set screw wrench and locate the assembly in a position engaging the proper magnification stop. Tighten the locking screw.

(4) The setting of the magnification stop for either projection lens may be checked by measuring the shadow image on the screen of a test pin which is brought into focus before the projection lens. The width of the shadow image received on the screen must be exactly the width of the test pin multiplied by the number of magnifications of the projection lens.

(5) To adjust the magnification, move the mirror assembly as described in (3) above until the shadow image of the test pin is exactly the right size. Move the mirror assembly toward the projection lens to decrease the size of the shadow image or away from the projection lens to increase the size of the shadow image. When the size of the shadow image on the screen is exactly right, tighten the mirror assembly locking screw.

(6) In the event that the adjustment of the magnification (5) above shows the corresponding stop to be wrongly positioned, the stop should be readjusted to its proper location. To do this, loosen the jam nut on the stop stud and screw the stop stud in or out of the turret as required. Hold the stop stud securely in its correct position and tighten the jam nut.

Note. A very thorough check of the projection lens and the measurements of the test pin and shadow image must be made before changing the adjustment of the stop.

d. Alinement of Chart Holder.

(1) Place a gaging chart in the holder as shown in figure 119. Any chart may be used to establish the alinement of the chart holder.

(2) The clamping screw holes in the chart holder are elongated vertically to permit adjustment of the vertical position of the glass gaging chart by means of the two vertical adjusting screws (figs. 114 and 116).

(3) The movable stops (figs. 119), which are used to position the glass gaging chart horizontally, are located at each side of the chart holder and are held in place by clamping screws which extend through horizontal slots in the holder. The slots permit sliding the movable stops horizontally when the clamping screws are loosened.

(4) Approximately center the chart on the screen in the horizontal direction, slide the movable stops (fig. 123) against the sides of the glass gaging chart, and lock the stops in position with their clamping screws. This prevents horizontal

movement of the chart but the movable stops should not press against the sides of the glass gaging chart sufficiently to prevent vertical movement of the chart.

(5) It is important that the gaging chart is resting squarely in the holder.

(6) Choose a sharply defined point or corner of the staging fixture as a reference point and raise or lower the staging table with the vertical handwheel (fig. 116) to bring the reference point of the staging fixture approximately on the axis of the lens system.

(7) Move the staging table forward and back by means of the focusing knob (fig. 116) to find the position at which a sharp shadow image of the reference point appears on the screen and adjust the position of the shadow image on the screen so that it barely touches the horizontal line which extends across the glass gaging chart.

(8) Slide the staging fixture laterally back and forth before the projection lens and by means of the chart vertical adjusting screws, aline the chart so that the shadow image of the reference point barely touches the horizontal line of the chart at every point across the chart.

82. General Operating Instructions for Comparator

a. It is important that all work, to be inspected, is clean and free from oil, dirt, lint, and all foreign matter to avoid distortions of the shadow image.

b. The shield (fig. 116) must be kept down during inspections to improve the contrast and sharp definition of the shadow image on the screen.

c. Use only the "setting" corner of the master for placing the staging fixture in its proper position on the staging table.

d. Note that a reversed image of the object is projected upon the screen. For example, in figure 120 the upper right-hand corner (in this case the "setting" corner) of the master appears on the screen as the lower left-hand corner (of the shadow image).

e. Because of the reversed projection of the lens system, any movement of the staging table or staging fixture produces a movement of the shadow image in the opposite direction.

83. Inspection of Trigger B200988

a. Accessory Set-Up and Adjustment.

(1) Place trigger contour screen, 18–S–1499–90 (fig. 14) in the proper position in the chart holder (fig. 119). The chart holder clamping screws may have to be slightly loosened in order to do this.

(2) Insert the 10-power (82-mm) projection lens, specified in the lower right corner of the chart as the scale, into the lens bracket in the body of the comparator (fig. 119). The lens bushing, which is not needed for adapting the 10-power lens to the bracket, should be removed if still in place.

(3) Locate the mirror assembly with respect to the 10-power stop pin.

(4) Place the trigger staging fixture 7319707 (fig. 11) on the table with its tongue engaged in the groove of the table (fig. 119).

(5) The trigger master should be placed in its correct position on the trigger staging fixture 7319701 exactly as in figure 120. It can be identified by the nomenclature "master for C7319701" on its face. In correct position, identifying nomenclature should be facing outward and its back should be against the fixture face.

(6) With the focusing knob move the table forward and back until a sharply defined image of the master appears on the chart.

(7) Raise and lower the table with the vertical handwheel and move the staging fixture in the groove in the table until the image of the highlighted, upper right of "setting" corner of the master is outlined by the "set master" lines indicated on the chart (fig. 120).

(8) If the sharp lines of the image do not lie along the "set master" lines, loosen the chart holder clamping screws and adjust the chart with the vertical adjusting screws. Then clamp the holder in this position.

(9) Tighten the hold-down clamp to lock the staging fixture in place.

(10) Remove the master from the fixture.

b. Inspection Procedure.

(1) Place the trigger in the proper position on the staging fixture 7319701 (fig. 11) as shown in figure 119. It should be against the face of the fixture

(2) On a satisfactory trigger the shadow of the contour being inspected, which is highlighted in figure 121, will fall within the limiting lines and conform to the other tolerances specified on the chart.

84. Inspection of Sear

a. Accessory Set-Up and Adjustment.

(1) Place sear screen 18–S–1499–70 (fig. 13) in the proper position in the chart holder (fig. 122). The chart holder clamping crews may have to be slightly loosened in order to do this.

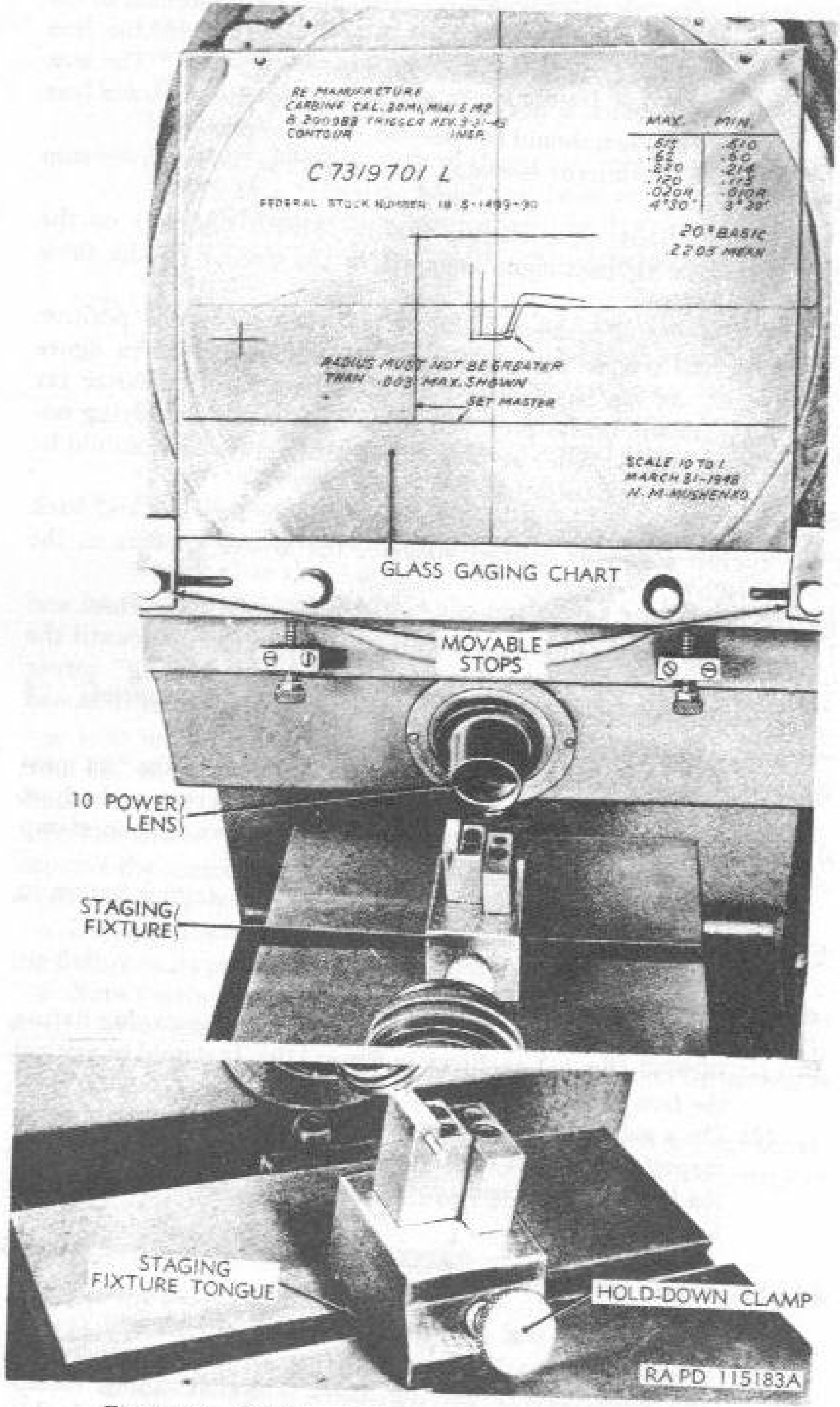


Figure 119. Screen and fixture set-up for trigger inspection.

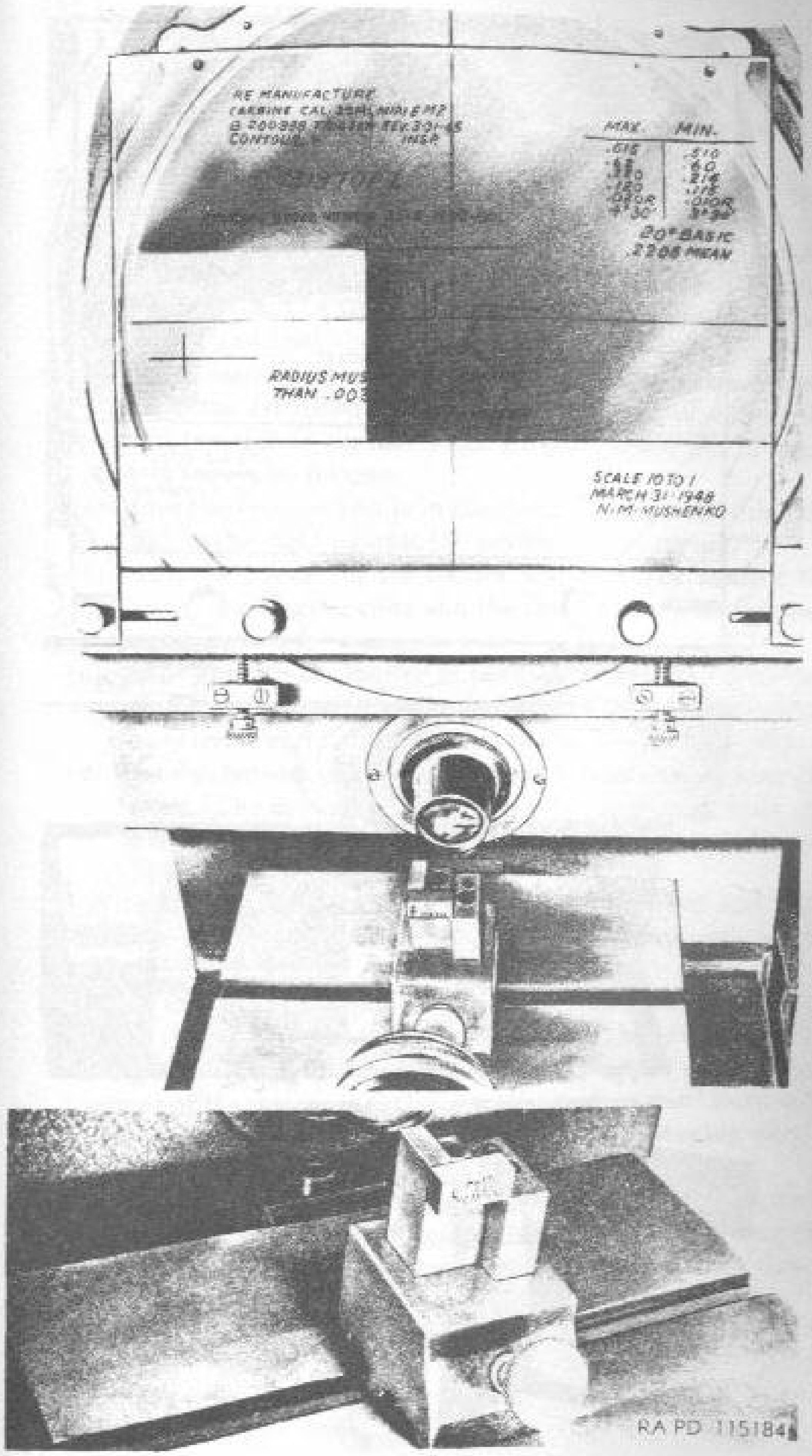


Figure 120. Screen and fixture with master for trigger.

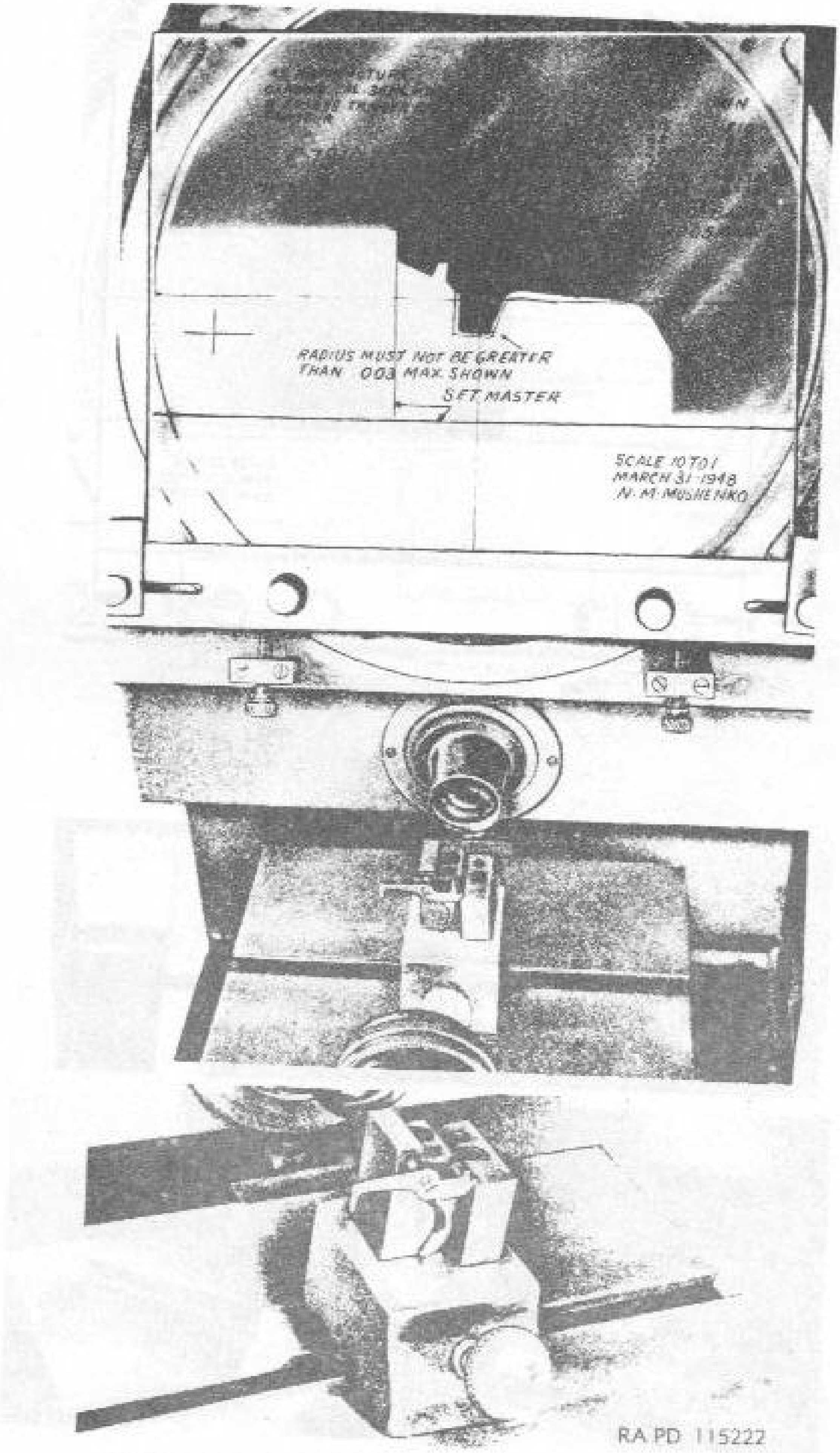


Figure 121. Screen and fixture with trigger in position.

(2) Insert the 10-power (82-mm) projection lens, specified in the lower right corner of the chart as the scale, into the lens bracket in the body of the comparator (fig. 122). The lens bushing, which is not needed for adapting the 10-power lens to the bracket, should be removed if still in place.

(3) Locate the mirror assembly with respect to the 10-power stop pin.

(4) Place the sear staging fixture 7319882 (fig. 11) on the table with its tongue engaged in the groove of the table. The fixture slide should be against the face and right side of the base (figs. 122 and 123).

(5) The sear master, which can be identified by the nomenclature "master for D7319882" on its face, should be placed in the correct position on the sear staging fixture exactly as in figure 123. Proceed as follows:

(*a*) Move the lever, which is in the slot in the fixture slide (fig. 123) to the right against the tension of the spring.

(*b*) Place the master in the fixture with its back against the face of the staging slide and the identifying nomenclature facing outward.

(*c*) While holding the master in position, release the lever and allow the spring to push the face of the holding bar against the extreme right, upper corner of the master (fig. 123).

(*d*) The flat bottom of the holding bar should not go over the ledge. The master is in the right position only when the face of the bar is pressing against the corner indicated (fig. 123).

(6) With the focusing knob, move the table forward and back until a sharply defined image of the master appears on the chart.

(7) Raise and lower the table with the vertical handwheel and move the staging fixture in the groove in the table until the image of the highlighted, extreme left, upper or "setting" corner of the master is outlined by the "set master" lines indicated on the chart (fig. 123). Do not move the staging fixture slide during this operation.

(8) If the sharp lines of the image do not lie along the "set master" lines, loosen the chart holder clamping screws and adjust the chart with the vertical adjusting screws. Then clamp the holder in this position.

(9) Tighten the hold-down clamp to lock the staging fixture in place.

(10) Remove the master from the fixture.

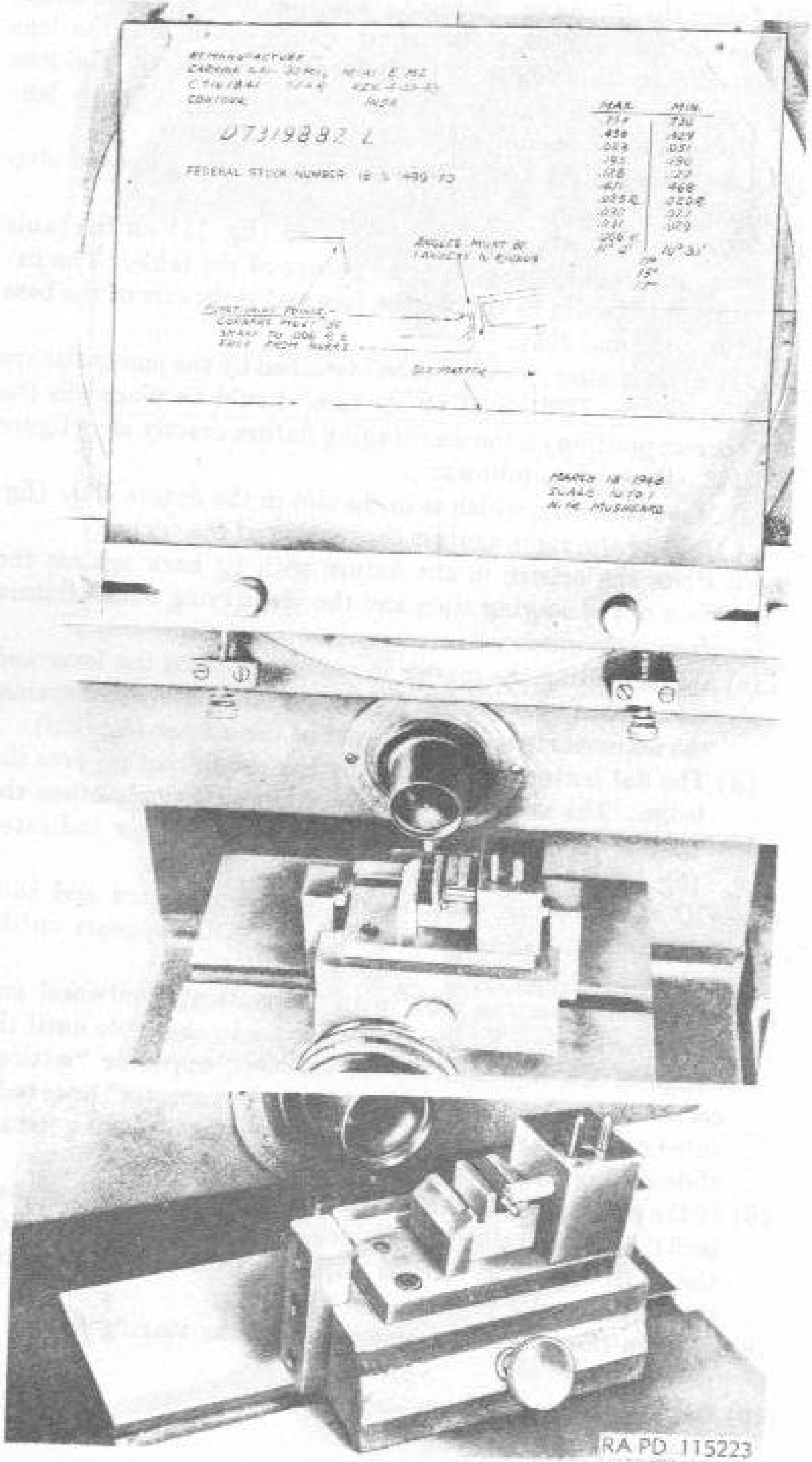


Figure 122. Screen and fixture set-up for sear inspection.

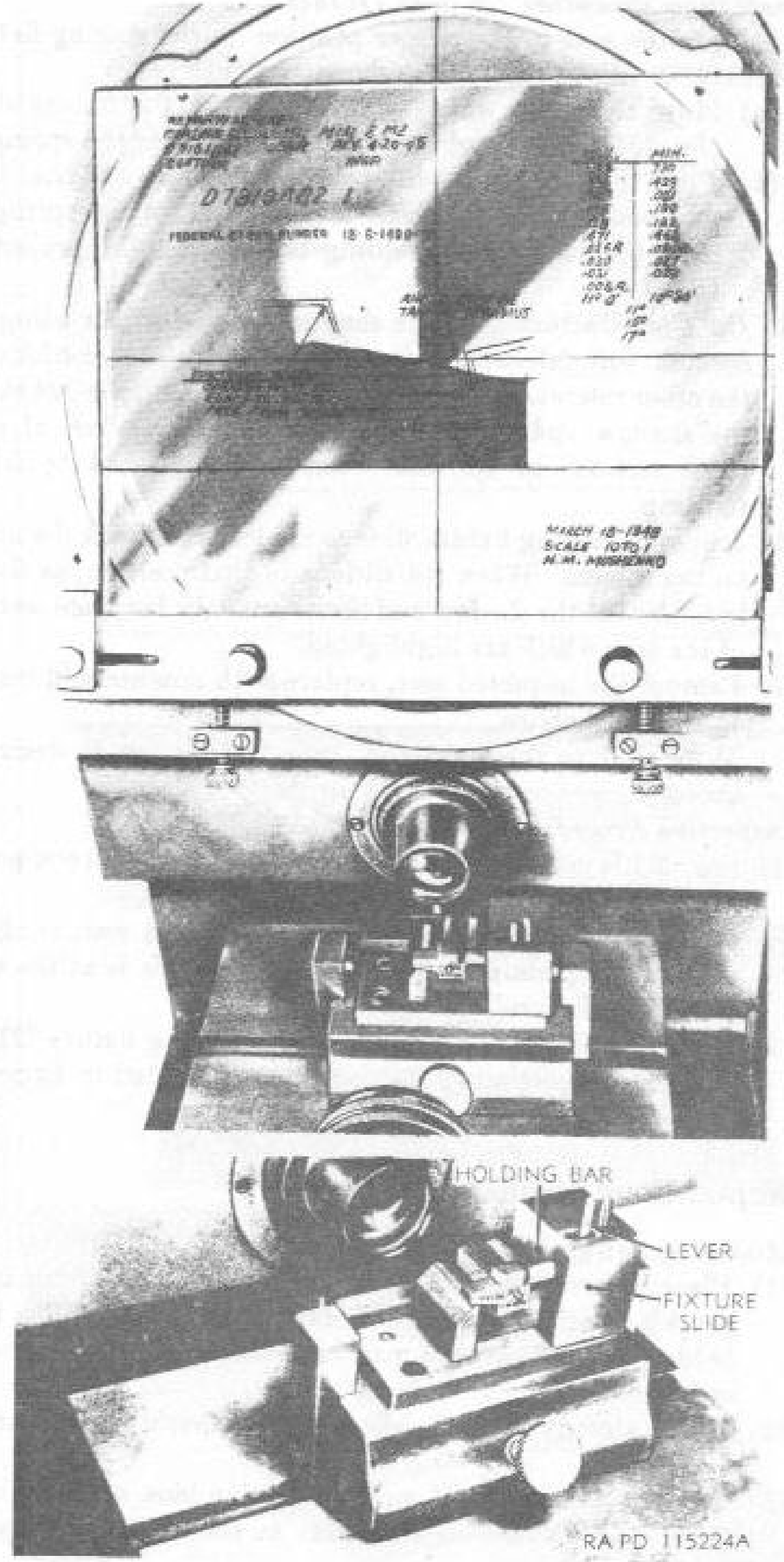


Figure 123. Screen and fixture with master for sear.

b. Inspection Procedure for Sear 7161841.

(1) Place the sear in the proper position on the staging fixture 7319882 (fig. 11) exactly as shown in figure 124.

(*a*) Move the lever, which is in the slot in the fixture slide (fig. 124), to the right against the tension of the spring.

(*b*) Place the sear against the face of the fixture and hold it in this position. Release the lever and allow the spring to push the face of the holding bar against the projection (fig. 124).

(2) On a satisfactory sear, the shadow of the contour being inspected will fall within the limiting lines and conform to the other tolerances specified on the chart. Figure 124 shows the shadow and limits for comparison inspection of only those sections of the sear which are indicated by highlighting.

(3) Move the staging fixture slide to the left and check the image on the screen. When the slide is in this position, as shown in figure 125 the shadow and limits are only for those sections of the sear which are highlighted.

(4) Remove the inspected sear, replace with another and inspect as described above.

(5) Move slide to the right (fig. 124) and inspect as described above.

c. Inspection Procedure for Sear 5653483.

(1) Sear M1 is inspected with the same procedure and equipment as sear M2.

(2) Only the highlighted contour section of this sear, as shown in figure 126, can be inspected when the slide is at the right side of the fixture.

(3) With the slide at the left side of the staging fixture 7319882 (fig. 11) the section of the contour highlighted in figure 131 can be inspected.

85. Inspection of Hammer

a. Accessory Set-up and Adjustment.

(1) Place hammer contour screen 18–S–1499–40 (fig. 12) in the proper position on the chart holder (fig. 128). The chart holder clamping screws may have to be slightly loosened in order to do this.

(2) If not already in place, insert the lens bushing into the lens bracket.

(3) Insert the 20-power (6-mm) projection lens, specified in the lower right corner of the chart as the scale, into the lens bushing (fig. 128).

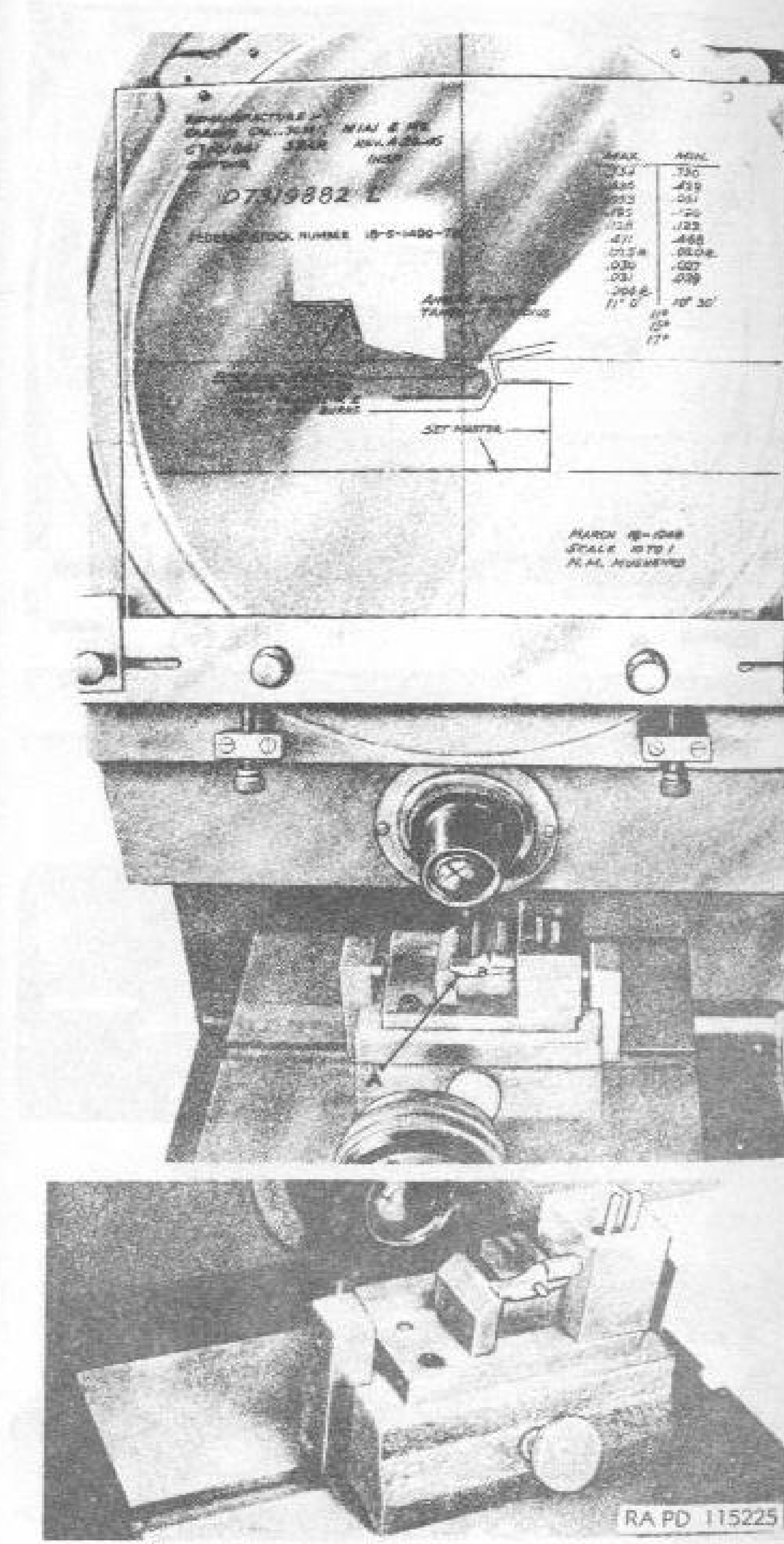


Figure 124. Screen and fixture with sear—slide in position 1—to right.

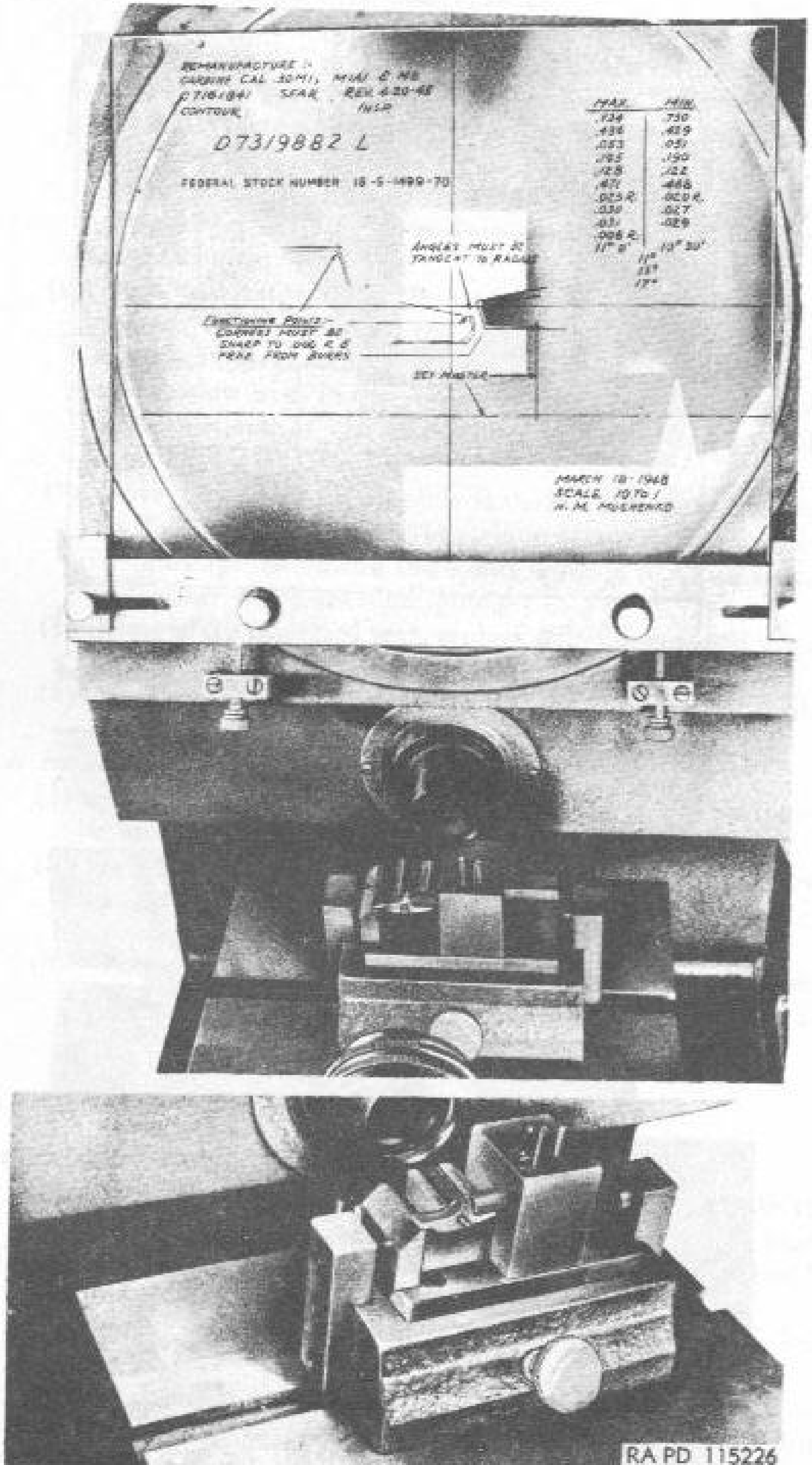


Figure 125. Screen and fixture with sear—slide in position 2—to left.

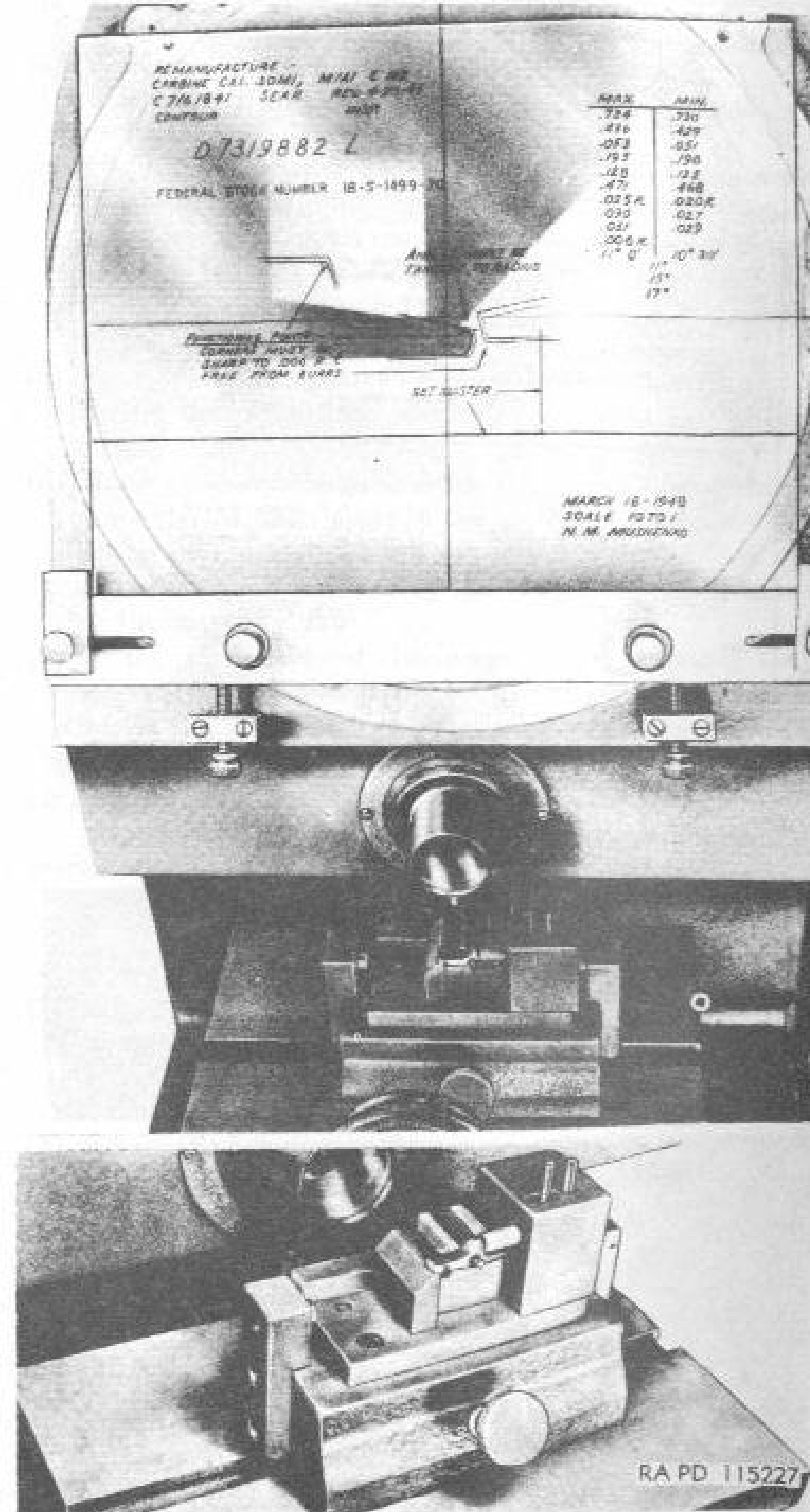


Figure 126. Screen and fixture with sear—slide in position 1—to right.

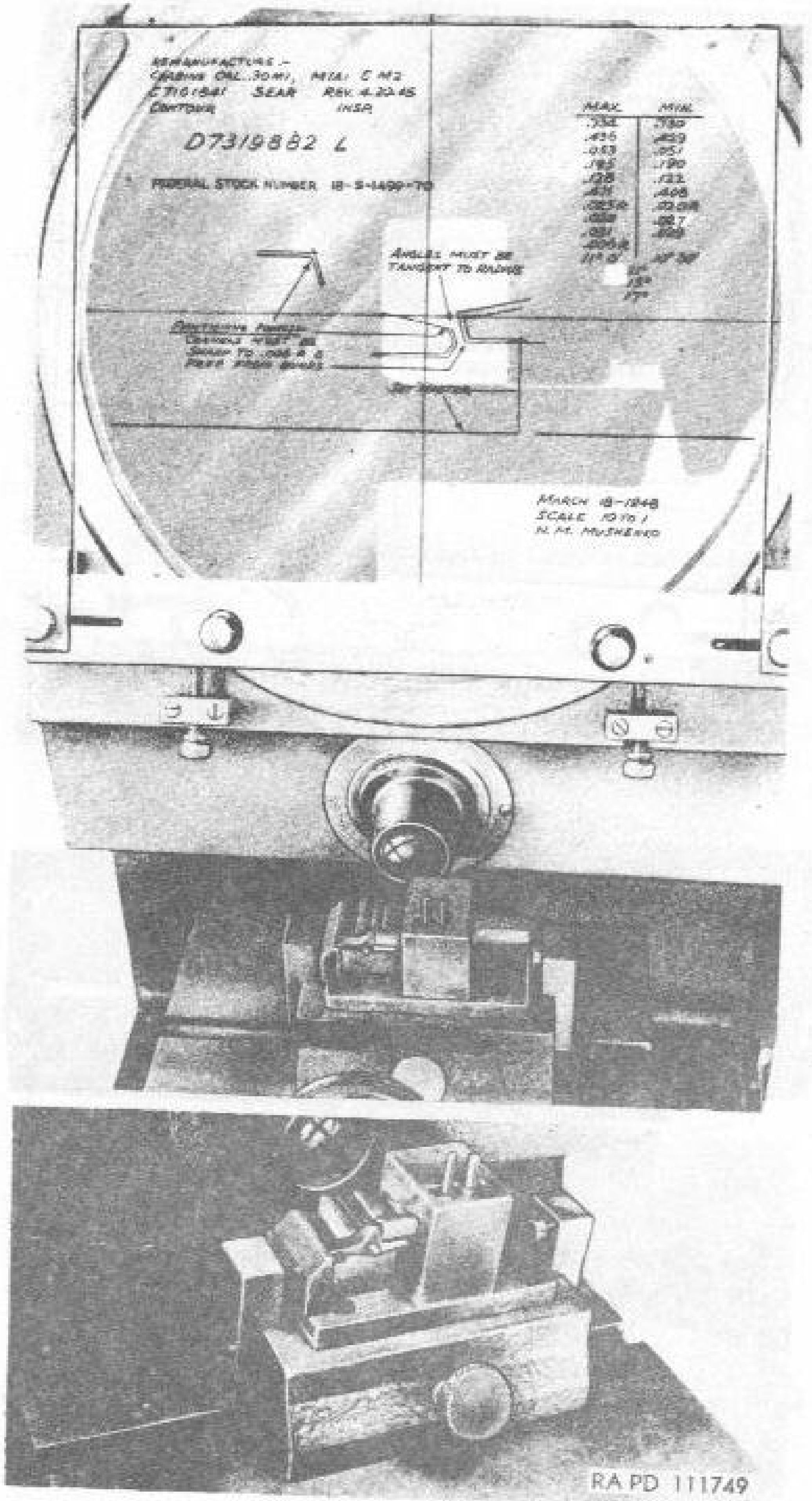


Figure 127. Screen and fixture with sear—slide in position 2—to left.

(4) Locate the mirror assembly with respect to the 20-power stop pin.

(5) Place the hammer staging fixture 7319811 (fig. 11) on the table with its tongue engaged in the groove of the table (fig. 128).

(6) The hammer master can be identified by the nomenclature "master for C7319811" on its face. It should be placed in its correct position on the hammer staging fixture exactly as in figure 129. In correct position, identifying nomenclature should be facing outward and its back should be against the fixture face.

(7) With the focusing knob, move the table forward and back until a sharply defined image of the master appears on the chart.

(8) Raise or lower the table with the vertical handwheel and move the staging fixture in the groove in the table until the image of the highlighted, upper right or "setting" corner of the master is outlined by the "set master" lines indicated on the chart (fig. 129).

(9) If the sharp lines of the image do not lie along the "set master" lines, loosen the chart holder clamping screws and adjust the chart with the vertical adjusting screws. Then clamp the holder in this position.

(10) Tighten the hold-down clamp to lock the staging fixture in place.

b. Inspection Procedure.

(1) Place the hammer in the proper position on the staging fixture 7319811 (fig. 11) exactly as in figure 130. It should be against the face of the fixture.

(2) On a satisfactory hammer the shadow of the contour being inspected which is highlighted in figure 130 will fall within the limiting lines and conform to the other tolerances specified on the chart.

(3) Rotate the hammer on the pin according to the instructions on the chart and as shown in figure 131. For a hammer to pass inspection, the requirements in (2) above must be met.

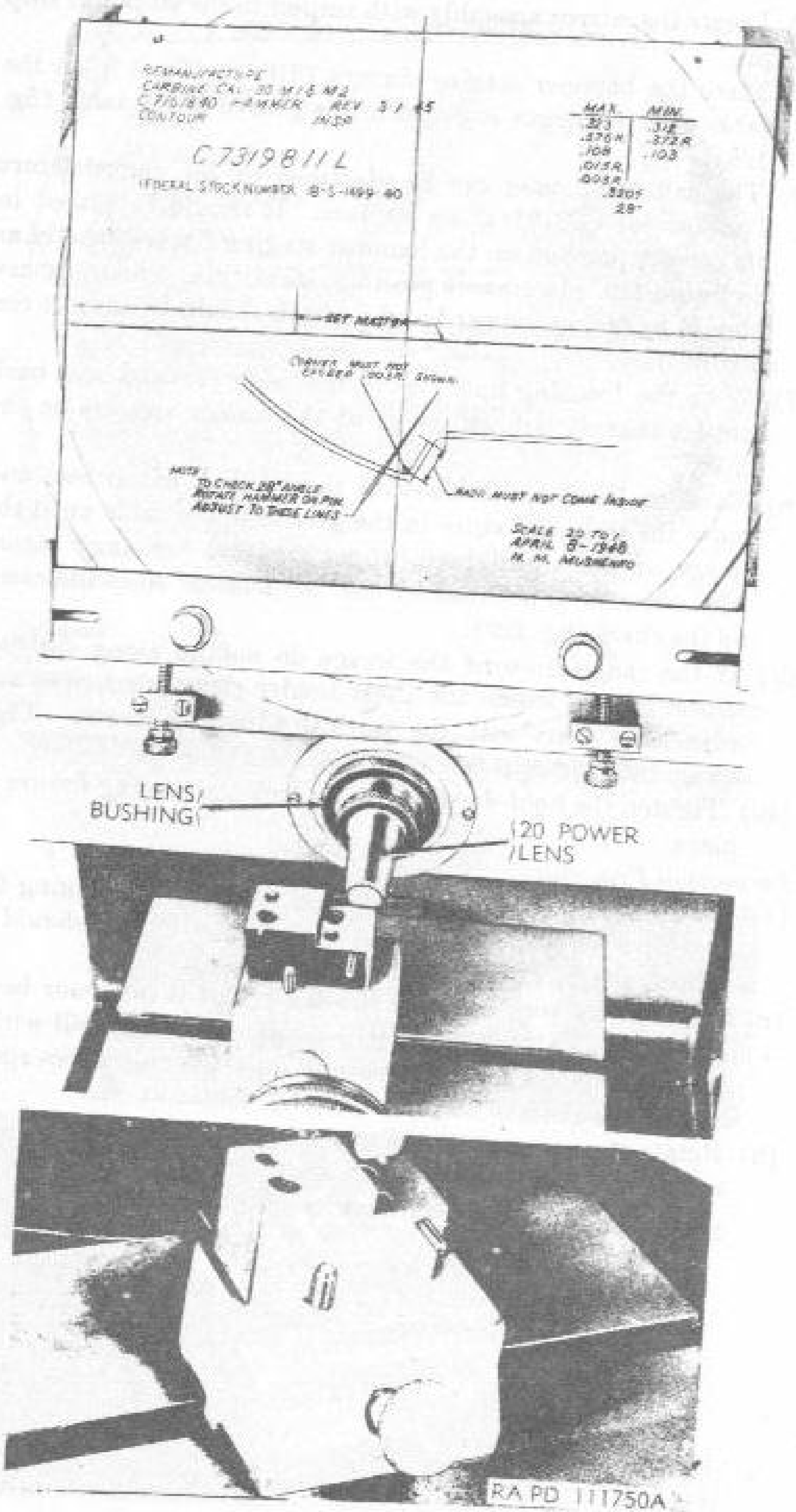


Figure 128. Screen and fixture set-up for hammer inspection.

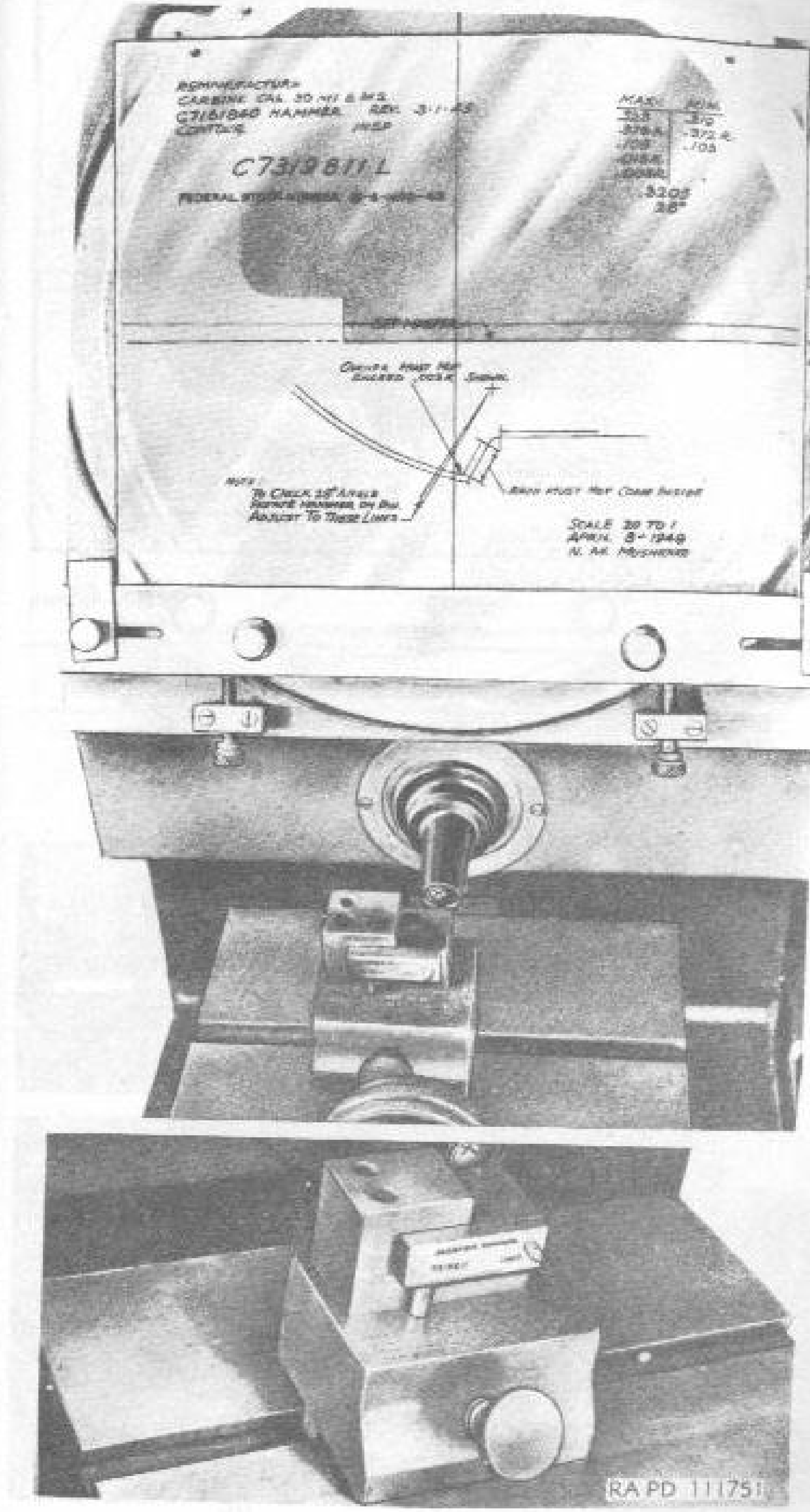


Figure 129. Screen and fixture with master for hammer.

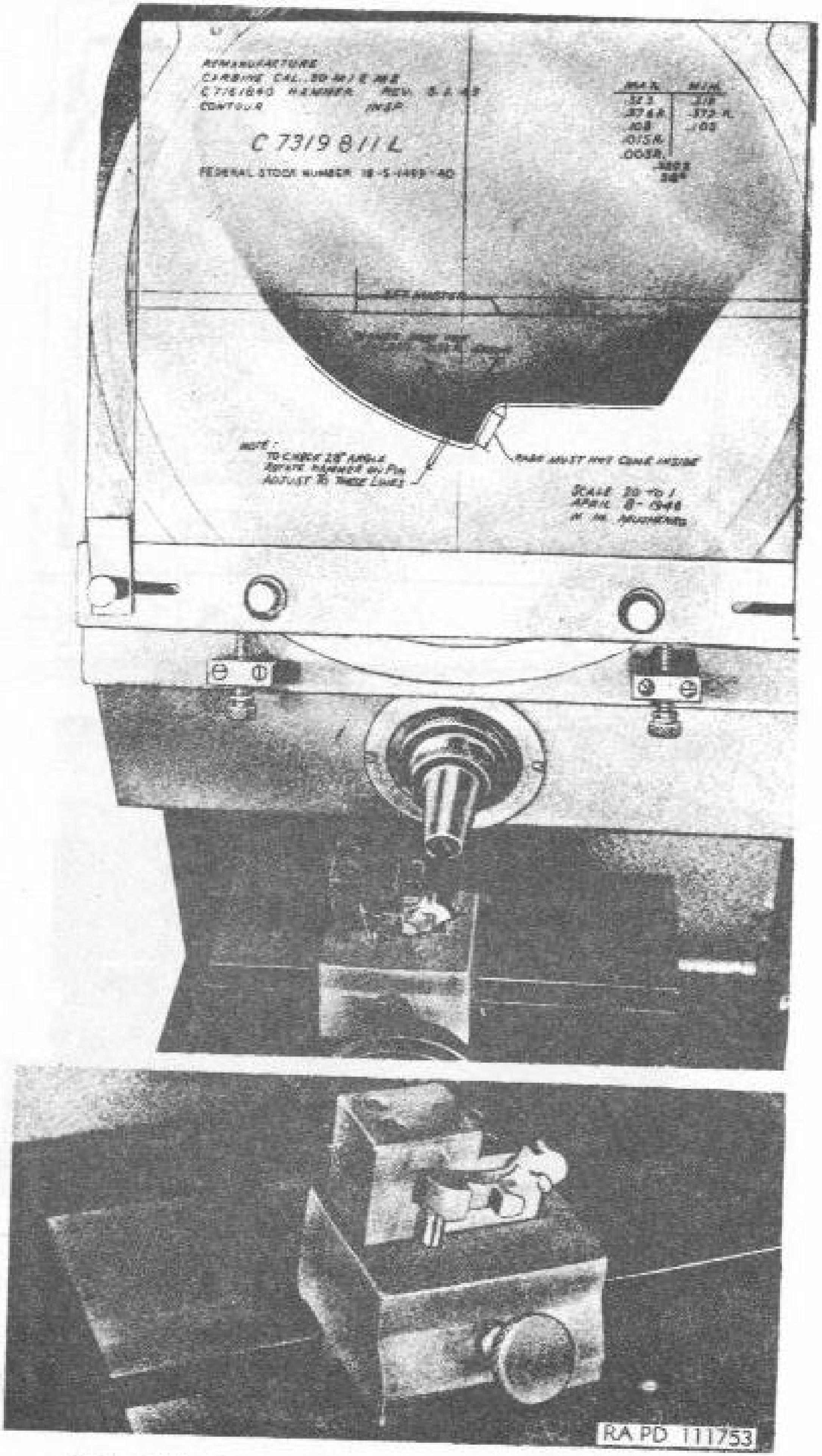


Figure 130. Screen and fixture with hammer in position 1.

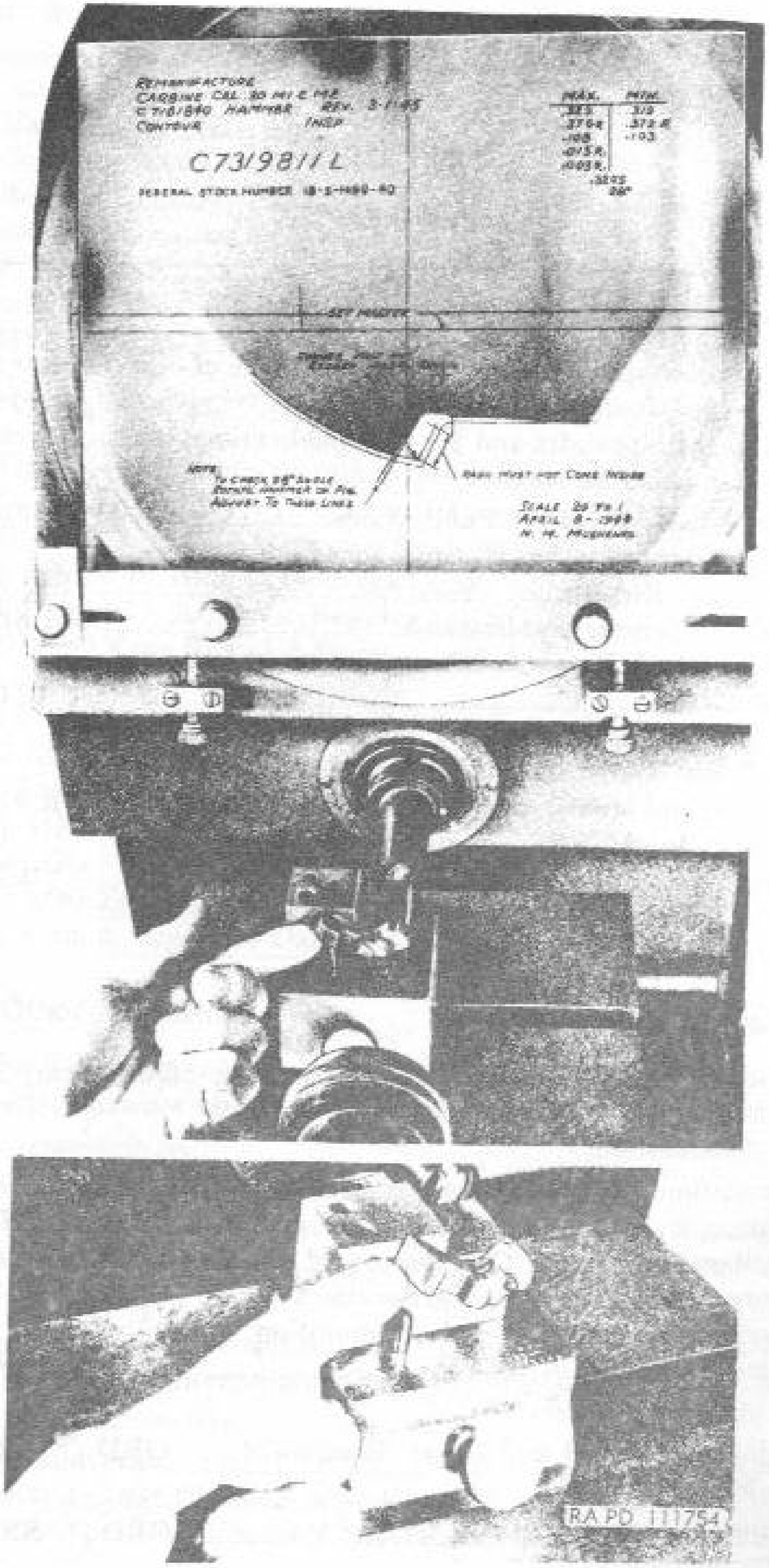


Figure 131. Screen and fixture with hammer rotated to position 2.

APPENDIX

REFERENCES

1. Publication Indexes

The following publication indexes and lists of current issue should be consulted frequently for latest changes or revisions of references given in this appendix and for new publications relating to matériel covered in this manual:

Index of Administrative Publications	SR 310–20–5
Index of Army Motion Pictures and Film Strips and Kinescope Recordings	SR 110–1–1
Index of Training Publications	SR 310–20–3
Index of Blank Forms and Army Personnel Classification Tests	SR 310–20–6
Index of Technical Manuals, Technical Regulations, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders	SR 310–20–4
Introduction and Index (supply catalogs)	ORD 1
Military Training Aids	FM 21–8
Ordnance Major Items and Combinations and Pertinent Publications	SB 9–1

2.* Supply Catalogs

The following catalogs of the Department of the Army Supply Catalog pertain to this matériel:

a. Ammunition.

Ammunition, Rifle, Carbine, and Automatic Gun	ORD 11 SNL T–1
Miscellaneous Service Components of Small-Arms Ammunition for Field Service Account, Instruction Material, and Ammunition for Simulated Small-Arms Fire	ORD 11 SNL T–4

b. Auxiliary Matériel.

Small Arms Target and Target Equipment	ORD (*) SNL L–1

c. Weapon.

Carbine, Cal. .30, M1, M1A1, M2, and M3	ORD (*) SNL B–28

(*) See ORD 1, for published catalogs of the ordnance section of the Department of the Army Supply Catalog.

d. Maintenance and Repair.

Cleaners, Preservatives, Lubricants, Recoil Fluids, Special Oils, and Related Maintenance Materials	ORD 3 SNL K–1
Lubricating Equipment, Accessories, and Related Dispensers	ORD (*) SNL K–3
Tools, Maintenance, for Repair of Group B Matériel	ORD 6 SNL J–12
Truck, 2½-Ton 6 x 6, Small Arms Repair, M7A1 and M7A2	ORD (*) SNL G–138

3. Forms

The following forms pertain to this matériel:

WD AGO Form 9–71, Locator and Inventory Control Card
WD AGO Form 9–72, Ordnance Stock Record
DA Form 9–76, Request for Work Order
DA Form 9–77, Job Order Register
WD AGO Form 9–78, Job Order
DA Form 9–79, Parts Requisition
DA Form 9–80, Job Order File
WD AGO Form 9–81, Exchange Part or Unit Identification Tag
DA Form 468, Unsatisfactory Equipment Report
WD AGO Form 865, Work Order
WD AGO Form 866, Consolidation of Parts
WD AGO Form 867, Status of Modification Work Order
DD Form 6, Report of Damaged or Improper Shipment

4. Other Publications

The following publications contain information pertinent to this matériel and associated equipment:

a. Ammunition.

Regulations for Firing Ammunition for Training, Target Practice, and Combat	SR 385–310–1
Small-Arms Ammunition	TM 9–1990

b. Camouflage.

Camouflage, Basic Principles	FM 5–20
Camouflage of Individuals and Infantry Weapons	FM 5–20A

c. Decontamination.

Decontamination	TM 3–220
Defense Against Chemical Attack	FM 21–40
Miscellaneous Gas Protective Equipment	TM 3–290

(*) See ORD 1, for published catalogs of the ordnance section of the Department of the Army Supply Catalog.

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d. Destruction to Prevent Enemy Use.

Explosives and Demolition ---- FM 5–25
Ordnance Service in the Field ---- FM 9–5

e. General.

Accounting for Lost, Damaged, or Destroyed Property ---- SR 735–150–1
Inspection of Ordnance Matériel in the Hands of Troops ---- TM 9–1100
Reports of Accident Experience ---- SR 385–10–40
Small-Arms Matériel and Associated Equipment ---- TM 9–2200
Unsatisfactory Equipment Report ---- SR 700–45–5
Targets, Target Material, and Training Course Layouts ---- TM 9–855

f. Repair and Rebuild.

Abrasive, Cleaning, Preserving, Sealing, Adhesive, and Related Materials Issued for Ordnance Matériel ---- TM 9–850
Instruction Guide: Small-Arms Accident Malfunctions and Their Causes ---- TM 9–2210
Lubrication ---- TM 9–2835
Marking and Packing of Supplies and Equipment: Marking of Oversea Supply ---- SR 746–30–5
Maintenance of Supplies and Equipment: Maintenance Responsibilities and Shop Operation ---- AR 750–5
Overhaul and Rebuilt Standards for Small-Arms Matériel ---- TB ORD 366
Painting Instructions for Field Use ---- TM 9–2851
Preparation of Supplies and Equipment for Shipment: Processing of Unboxed and Uncrated Equipment for Oversea Shipment ---- AR 747–30
Preservation, Packaging, and Packing of Military Supplies and Equipment ---- TM 38–230
Usage Factors for Small-Arms Weapons ---- SB 9–50

g. Shipment and Long-Term Storage.

Inspection, Preservation, and Maintenance in Storage of Small-Arms Matériel ---- SB 9–65
Instruction Guide: Ordnance Packaging and Shipping (Posts, Camps, and Stations) ---- TM 9–2854
Marking and Packing of Supplies and Equipment: Marking of Oversea Supply ---- SR 746–30–5
Ordnance Company, Depot ---- FM 9–25
Ordnance Storage and Shipment Chart—Group A ---- TB 9–OSSC–A
Processing of Motor Vehicles and Related Unboxed Matériel for Shipment and Storage ---- SB 9–4

h. Weapon.

Sniperscope M2 ---- TM 5–9341
U. S. Carbine, Caliber .30, M1 and M1A1 ---- FM 23–7

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